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ORIGINAL LECTURES.

INFANT FEEDING AND INFANT FOODS.

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MR. VICE-PRESIDENT, LADIES AND GENTLEMEN, MEMBERS AND DELEGATES OF THE MEDICAL SOCIETY OF THE STATE OF NEW YORK: I hold in my hand a report of the Committee appointed to co-operate with the New York Society for the Prevention of Cruelty to Children, "in all things pertaining to the physical and moral safety of infants and children." The report I refer to was read in last year's meeting, and has been widely distributed by the above-named Society. One of the measures contemplated and advised in it was, that there should be a place or places in large cities, where the infants and young children of the poor might be supplied, at cost, with the simple though sufficient articles of food. These simple and sufficient articles of food were milk, barley, oat-meal, and, for those no longer infants proper, eggs. Their value as infant food for those who were without breast-milk, was taken for granted, and considered almost in the light of an axiom. To make it so has been one of the duties of my life. Truth, however, is frequently suspected because of its very simplicity, and often do we see complicated and roundabout means and measures resorted to in preference to plain and direct ones. Now, what I have to say may, in part, appear very common-place and trifling, because of its application to common-place things and interests. But questions are involved which it has taken, and will still take, much time and labor to solve. To render the results hitherto obtained available, the normal feeding of the infants possible, and to protect them from the injuries inflicted by ill-directed love, ignorance, and the evil-devised plans and frauds of what is called commerce and industry, will be the object of the brief remarks which I shall have the honor to make before you in regard to the dangers to which our infants are constantly exposed.

Mortality amongst infants is very great. In Europe, out of one hundred born alive, eighteen die before they reach the end of their first year. Out of one hundred who die at all ages and of all diseases, in New York City, twenty-eight are less than a year old. The causes of these deaths vary; it is a characteristic fact, however, that of all those taking place in infants under a year, from 40 to 53 per cent. are the results of diseases of the organs of digestion.

Thus the attention of the physician called to see a sick child is mostly claimed by the alimentary canal. His care and that of the mother or attendant is therefore due to preventive measures mostly. The best preventive measure, and sometimes it proves curative, is the breast-milk of mother or wetnurse. That is an axiom, an undisputable law of nature, as long as the circumstances of the case are favorable. In view of the great mortality in the first two months, breast-milk is the one and indispensible food for those under two months. A mother who refuses to nurse *at least that time* for other than reasons of health or life, is an accomplice in causing, perhaps even the only cause of, the death of her offspring. It is true that a baby may be taken sick with intestinal disease in spite of being nursed at the breast, for there are *many* causes of disease; it may, however, occur that babies are taken sick *because* of being at the breast. And it is those cases that both mothers and physicians ought to be well acquainted with. Sometimes it is not the breast-milk which is at fault, in the beginning, but the faulty use it is put to. Many babies suffer intensely because they are not limited to intervals of from 2 to 4 or 5 hours, as required by either age or constitution. In their cases, by too frequent feeding, both the milk of the mother and the digestion of the infant, are impaired. Here regularity is the sole indication. Sometimes, though fortunately in few cases only, there appears to exist an idiosyncrasy not explained, on the part of the baby who cannot thrive on the milk of the mother, and may do so after a change of food. In many cases, however, there are demonstrable dangers in the very breast-milk of either mother or nurse; there may by an undue percentage of fat, or of cheese, or of salts, or of sugar, or even accidental admixtures. These may occur in the secreting organ (thus blood may be found in the milk) or be traceable to the circulating blood of the whole system; of the latter they may be the very constituents, or foreign bodies floating in it. They can be classed as either morbid dispositions or as actual admixtures. Women suffering from constitutional syphilis, chronic consumption, or anæmia, extensive rachitis, severe nervous derangement, hysterical or other, those suffering from care and hard work, and those who are compelled to take a great deal of medicine, will serve their babies best by not nursing them at all.

In regard to the influence of the medicines, the opinions *have* been divided. It was claimed that milk being a secretion of the gland, and not a transudation from the blood, would not contain foreign material to any great extent. That is true so far as an absolutely healthy woman and normal milk are concerned. But the first period of lactation yields colostrum, not normal milk, and very often the latter is changing into a colostral condition, such as it was soon after birth, containing different-shaped fat globules, more sugar, soluble albumen, in fact, real blood serum. This may take place in every case of impaired health. And the more serum of blood is contained in any milk, the easier is the admixture of soluble substances circulating in the blood. Such substances are ethereal oils, coloring matter, iron, iodide of potassium, arsenic, zinc, mercury, salines, bismuth, lead, antimony, nitrate of potassa, magnesia, all of which have been frequently found in the milk, and frequently missed. They will be missed the more frequently the healthier the woman and its mammary secretion. But, as I formulated the subject some years ago, milk secreted from an insufficient mamma, by a woman not in full health and vigor, by an old woman, by a very young woman, by an anæmic woman, by a convalescent woman, who has consumed a large portion of her albumen, be it circulating or tissue albumen, by a neurotic woman with frequent disturbances of the circulation—milk, in fact, which is not the normal transformation of the elements of the mammary glands, but consists of more or less transuded serum, is apt to be impregnated with elements circulating in the blood. The indications on one hand for the permission to nurse, on the other, for the administration of medicines to a nursing woman, require, therefore, a

greater strictness than is usually conceded. At all events, the good results obtained in many cases of ailment on the part of the infant, *by artificial feeding, in preference to nursing*, are better than accidental.

Those infants who are thus deprived of breast-milk, or never had it, or have an insufficient supply of it, require artificial feeding. The material resorted to ought to be as much like mother's milk as possible; and naturally, when human milk cannot be had, animal milks are selected. Amongst them only two are available to any extent, that of the goat and of the cow. If there be any objection to either, it is principally valid in regard to the former. For the chemical incongruities and other difficulties, to which I shall briefly allude in regard to cow's milk, are even more pronounced in the case of goat's milk.

My remarks of this evening I expect to be of a practical nature throughout, and brief. Thus I shall not try to go into chemical or physiological questions beyond the time allotted or the opportunity afforded. Therefore, I shall allude to but two points which it is interesting to appreciate, in order to understand why it is that cow's milk, as a sufficient substitute for mother's milk, must necessarily be a failure.

Human milk and cow's milk differ mainly in that the percentages, and probably also the properties, of fat and of caseine contained in them, differ widely. The percentage of fat in cow's milk is larger than in human milk, and, on close observation, we shall learn that woman's milk contains as much fat as the young digestive organ can tolerate. From what we know of the diastatic power of the infant pancreatic gland, we must conclude that its property of digesting fat is but slimly developed soon after birth; and daily observation proves that such is the case. When you examine chemically the normal alvine digestions of the infant, well mixed, uniform, and yellow, you will discover not only fat acids, but free fat to the extent of about 12 per cent. Some more fat leaves the intestines in a saponified condition. Many of the passages which have been believed to contain caseine in excess, because of their white color, were found to contain large quantities of fat. And all this happens when the normal infant is fed exclusively on normal breast-milk. Now if much fat is not required nor absorbed under normal circumstances, if fat acids form so easily when the digestion is apparently normal, with the constant tendency of deranging digestion; if we know, as we do, that even normal breast-milk contains more fat than the infant has any use for, we must admit that in artificial feeding, with cow's milk or other material, we are in greater danger from giving too much fat than too little. Good milk has been called that which contains most fat, say from four to five per cent. The more cow's milk deserves the title of being good—that is, fat—the greater is the danger arising from giving it to infants without considerable modification. This result authors appear to gradually appreciate. When Forster fed a baby of four months with cow's milk and rice decoction in the proportion of 1 to 4, all the albuminous substances and sugar of this mixture had disappeared when the fæces came to be examined. Thus they were entirely digested, but of the ashes 34, and of the fat 30 to 40 per cent. were found unchanged. This experiment proves, in the opinion of Prof. Bollinger, whom I rejoice in quoting, that a milk less rich in fat is more adapted to serve as infant food than one with a large percentage of fat; and further, that cows whose milk is destined to be used as infant food, ought to be fed so as to reduce rather than increase the amount of fat contained in it. A good authority, Prof. Feser, makes the distinct statement that the milk he examined on the Alps of Switzerland, and which he prefers greatly as children's food, contained less fat than that from the cows in the neighborhood of a large city. If that be so, and it is so, I recommend as a matter of practice that the morning milk, with its lesser percentage of fat (butter), should be given, in preference to evening milk, if any at all.

Now, if the excess of fat be one of the causes why cow's milk should not be employed as infant food, why not remove it or diminish its percentage? Easily said, not easily done; for when milk is allowed to stand, and the cream to rise, the milk at the same time changes its reaction. Instead of being alkaline or neutral, it becomes acid, and acid milk is a danger which an infant must be protected from. Some years ago, Lefeldt and Delaval invented each an apparatus which, by rapid centrifugal motion, separates the cream from the milk very thoroughly. Such an apparatus may, perhaps, be found useful in reducing the normal fat of cow's milk to an acceptable standard in the future. For the present, however, I know of no proceeding which accomplishes the end in view; and, while submitting to the unavoidable, I must protest against the avoidable occurrence which is reported to have taken place in a court of justice but lately. In one of the skim-milk police cases—and unfortunately there are less "cases" than adulterations—the expert for the defence, a well-known chemist, tried to clear his client by proving him a public benefactor, inasmuch as Dr. Jacobi objected to an excess of butter in the milk used for children.

Caseine is represented in cow's milk in a larger percentage than in human milk. To reduce its relative quantity, compared with the rest of the solid constituents, is possible by the increase of these only. There is no method by which its absolute quantity in a given amount of milk could be diminished, except such as would render the remaining part of the milk unfit for use. This diminution, moreover, would have to be a very thorough one, for a mixture containing more than 1 per cent. of caseine has been found to be indigestible by Hammarsten, and by Biedert. But these are not the only objections to cow's-milk caseine. Not only is its percentage in the milk too great; its chemical and physical properties *differ greatly* from that contained in human milk. Mineral, acetic, and tartaric acids, epsom salts, phosphate of lime, form a dense and hard coagulation with the caseine of cow's milk, while human milk coagulates in loose and small flakes only, under the same circumstances. Cow's milk, when introduced into the infant stomach, forms hard curds; if the organ be strong, or the infant liable to vomit easily, as most of them are, thick massive pieces of cheese are thrown up, and relief will follow. If no vomiting occur, these hard masses are propelled into the intestinal tract, where sometimes they give rise to obstruction. Sometimes, however, they irritate the canal to such an extent, that *diarrhœa* is the result. In both cases lumpy cheese is the main constituent of the evacuations. In every case of infant diarrhœa, the examination of the passages ought to be made; in many cases the appearances will be found as described, and no case of the kind will terminate favorably unless the food be changed. To say that these cases will occur, would not do justice to the facts. They are very frequent, I have seen hundreds; but lately a child of sixteen months of age, and of six pounds in weight, was presented to me with the same symptoms, and with the additional remark, not only that everything had been done by the medical adviser to stop the exhausting diarrhœa, but also that a cow had been purchased for the sole purpose of furnishing pure milk for the suffering baby. That suffering baby was instantly improved when the pure milk was stopped, and more suitable food was substituted.

The objections to cow's milk, as the exclusive diet of infants, in place of mother's milk, which cannot be had, are dependent on its very chemical composition and physical properties. These cannot be changed by

the most studious and successful attempts at procuring the most uniform and pure article possible. That, however, does not prove that a bad or indifferent milk is as good and useful as the very best milk from the very best cows. The inference is rather this, That the employment of inferior milk is criminal when good milk can be had through precaution, care, and industry. To have accomplished that purpose is the pride of several European cities. In some it was through medical societies that the idea was started and put into effect, to procure as good milk as cows of good stock, well fed under favorable sanitary conditions, could furnish. Stuttgart had the first establishment of the kind; that in Frankfort-on-the-Main commenced its operations in 1877, with thirty cows, and increased that number to eighty-one in 1881. The amount of milk produced, and delivered to consumers, in 1881, was 313,563 litres (quarts), more than ten quarts per cow daily. The establishment is private property, but to earn the support of the public, and to secure the desired co-operation of the physicians of the town, the proprietor bound himself not to engage in any other business, and solicited the control and advice of a committee, consisting of three delegates of the medical society, one veterinary surgeon, and one chemist. Great pains are taken in the purchase of animals of a good stock, all of them thus far being imported from Switzerland. Before they are admitted, they are examined by the veterinary surgeon, who superintends the institution, and keeps a regular record of those who may fall sick. Two months before calving the milk is not sold at all. The age of the cows of from three to eight years is considered the only available one. The stables are well ventilated, and washed, drained, and connected with the system of city sewers. The floors of the stalls, the ceilings, and the lower part of the walls are cemented. The skin of the animals is looked after with great care. The stables are so near the city limits, that the milk cannot suffer by transportation. It is tightly corked in half-quart and quart glass bottles (this process being cautiously watched), and speedily delivered. Printed directions for its further treatment accompany the article. Besides, stress is laid on avoiding a prejudice on the part of the public, to which I have raised objection long ago with but very partial success, viz., not to select the milk of a special cow for the special use of the same individual, but to mix and equally distribute the milk of the whole dairy.

A great innovation for practical purposes, based on good experiments and long experience, is that no change of food takes place, and poisonous, purgative, or otherwise injurious admixtures to the food of the animals are avoided. Dry food only is given, viz., 15 kilog. (30 pounds) of hay, 6½ kilog. (13 pounds) of meal and bran, 6 grammes (1½ drachms) of salt, and spring-water to drink.[1]

Human knowledge and foresight have almost exhausted themselves in these praiseworthy efforts. But the result of them all is *good cow's milk, and no equivalent for mother's milk*. But do I mean to say that cow's milk, given pure, or cow's milk mixed with water, is absolutely injurious, poisonous, to babies? Far from it. The undeniable fact that there are infants who thrive on that exclusive diet, or whose general condition of health remains such that no medical or medicinal interference in their behalf appears called for, would give the lie to such an exaggerated opinion. Still, there are a great many infants *who appear* to thrive better than *they actually do*. Many grow fat and rotund on improper food, no immediate harm makes its appearance, and still you see many such as increase in weight, even more than the average infant, and still lay the gradual foundation to future ailing. For such fatness and rotundity means, too frequently, rachitis, and requires watching and change of food. Still, the number of infants remaining in good condition on that food is not very small. What does it prove? Nothing else but that the digestive processes permit of a certain latitude, that nature does not do routine work, and that the sum total of vital processes do not respond to certain occurrences, or influences, like reagents in a chemical test, where the same process always yields the same results. There is *no food on which certain infants will not thrive*. But when, in a large percentage of cases, the same unfortunate results are exhibited, and when these can be traced to their exact and uniform cause, that particular food is to be condemned. The assertion of many that cow's milk is an exact substitute for human milk, is the counterpart of that which claimed equality for animal and human blood. The practice, based upon this assumption, resulting, as it did, in the transfusion of animal blood into the human circulation, outlived itself very speedily.

Cow's milk, as a universal substitute for mother's milk, has lost its credit with many through the differences in the article; which, however, as long as no adulterations are perpetrated, are less marked than the same secretion of the human being. If that were not so, how does it happen that all over the civilized world substitutes are sought for, offered, and purchased, though milk be as cheap and handy as anything else? Why is it that to avoid cow's milk, untold risks are run in procuring more expensive, more unknown, and more unreliable vegetable compositions, which seldom keep the promises loudly displayed on the labels? What are these promises? What does it mean when they claim to take the place of mother's milk?

Mother's milk is considered the best prepared article of food known, though, as you have been told before, it may be—it could have been improved upon. Perhaps *it is* the best, though; at least there was a time when we all were of that opinion; for perhaps the surplus of fat, which passes off undigested, may serve some purpose hitherto unknown. An ideal article of food must serve two purposes and consist of two classes of constituents. It must, in the infant, supply the growing tissue with material sufficient to take the place of that which is constantly wasted, and to allow a surplus for increase; and, secondly, supply fuel for the purpose of keeping up the production of an equable temperature and the functions of the organs, mainly those of respiration. The first requirement is fulfilled by the proteinous, or albuminous, substances, the other by carbo-hydrates. This statement would require modifications, if it were the object to be absolutely correct, for the two classes will supply each other, act vicariously for each other, even change into each other, under certain circumstances, in the complex machinery of the human system. The albuminous tissue-builder in the milk is mainly caseine, sometimes, also, albumen; the second class is principally represented by fat and sugar. In vegetables the first class is represented in the gluten, the second mainly in the starch. If you add, that in the milk, the ideal food, the proportion of the first class to the second is about 1 to 4, the vegetable substitutes are to be judged, in regard to their mere chemical composition, to that formula of about 1 to 4.

But it is not the chemical formula alone which determines the rank of a substance as a nutriment. To the equivalents of the chemical formula of cow caseine infant mathematics would not object, did not the infant stomach revolt against it. Thus it is not exclusively the chemistry of an article, but its digestibility, which comes into question. Now, not everything is equally digestible for everybody, sick or well, old or young,

[1] Dr. V. Cnyrim, in "Frankfort-on-the-Main, Its Hygienic Conditions and Institutions." Ed. by Dr. A. Spiess, 1881.

adult or child, child or infant, infant or newly born. And particularly is that so with regard to starch, which forms such an overwhelming part in the composition of vegetables, and particularly of those which are mainly used for the purpose of the manufacture of infants' foods.

Starch is changed into sugar and rendered digestible by the secretion of two sets of glands, the salivary glands and the pancreas. The latter does not possess that function before the end of the first month of life. The former begins to perform the same function, to a certain degree, immediately after birth. The experiment has been made by Schiffer, Korowin, and many others. Starch, enclosed in a small bag, is introduced into the mouth of the infant. After a certain time the starch is found to be transformed into sugar. To collect fifteen grains of saliva in a baby of two or three weeks took from fifteen to thirty minutes; in a baby of two months, but one or two minutes. Thus two facts result from these experimental observations: 1. That starch is digestible at any age; 2. That the transformable and digestible amount of starch is but very small in the first weeks of an infant, and increases gradually. About the eleventh month the digestive property of the saliva is equal to that of an adult, when the quantities are equal.

The inferences to be drawn are: 1. That farinaceous foods may contain starch, but *starch must not be the main part* of the food; 2. That when they contain a great deal of starch it is best to change it, by a thorough baking process, into dextrine, which is changeable into sugar, and is easily absorbed and utilized; 3. That those farinacea ought to be selected for infant food in which the proportion of gluten to starch favors the former.

There is another consideration of vast importance, which, when the infant foods now in the markets were first manufactured, could not be known. Starch is not the same article everywhere. In different substances it requires different times to be transformed into sugar. Potato starch requires 2 to 4 hours, that of peas 1¾ to 2 hours, wheat ½ to 1 hour, barley 10 to 15 minutes, oats 5 to 7 minutes, rye 3 to 6 minutes, maize 2 to 3 minutes.

Guided by these facts, I invite you to scan with me a number of farinaceous substitutes—their claims, promises, and powers. You will notice, there is not one of the men or companies who supply them but is loud in the praise of his gift to infancy; not one but ranks in his actual or alleged estimation as the arch-benefactor of mankind.

Justus von Liebig's (the great chemist) substitute consisted of the flour of wheat and barley malt, bicarbonate of potassium, water, and milk in certain proportions. For about twenty years this preparation has been the subject of eulogies and reproaches, until in its original form it has been nearly given up; for its home preparation is not so easy as its inventor claimed.

It requires too much care and attention from a person of intellectual undersize. Besides, everything containing sugar is liable to decompose in summer by fermentation and moulding; all preparations *really dry* have a bad taste. Moreover, the phosphate of lime, which, it is true, is found in sufficient quantity in both wheat and malt, does not get into the solution, and finally, *for its preparation*, you always require *milk*, milk in winter and summer, milk in city and country, with all its actual or alleged dangers. Still more, it has, though prepared ever so carefully, proven unsuccessful in too many cases. Diarrhœa has often resulted from its use. Numerous attempts have been made to put it up for the market in such a shape that little time and no intellect might be required for its final use. *Loeffluud's* article has the merit of being no fraud as far as I know; that of *Liebe* I paid attention to when it was first largely advertised for sale. A dozen bottles contained in a box were examined; their consistency and composition differed considerably. Another preparation, alleged to be compounded according to the prescription of the great chemist, is sold with the name of his son, *Herman von Liebig* attached to the recommendation of the label. He has a great deal *too much* to say in its praise. "1. This remarkable preparation accomplishes everything that can be expected of a substitute. 2. Although the flour is a perfect nutriment in itself, I still recommend on my labels its mixture with cow's milk. 3. Where good cow's milk cannot be had, condensed milk may take its place. 4. Infants fed on cow's or condensed milk, ought to have it mixed with my flour." You see the unsophisticated public must come to the conclusion that the object and destination of this food is no other but to be purchased.

Next in order is *Nestle*, as widely known as plantation bitters and cider vinegar. This food consists of milk, wheat flour (alleged to be baked, for the purpose of crushing the cellulose and cell membranes), sugar, and salts. As a chemical critic says (H. Mueller, in *Pharm. Centralhalle*, xvi., 1875, n. 34), he publishes no analysis but advertisements only; and he knew how to advertise. I remember well when the people of New York awoke one morning to find their libraries increased by a big pamphlet containing the new revelation. It was written by no less a person than an emeritus university professor of pathology, in his time a justly celebrated man, Lebert, who passed his very old age in the neighborhood of where Nestle had established his health, life, and money-breeding factory. Every such pamphlet commences with a declaration of principles. This begins by telling the reader that cow's milk is more "nourishing" than human milk; that, however, the addition of water does not make it any more similar to the latter; and that the nursling ought to have cow's milk at once alongside that of his mother—probably to improve upon nature's plan. Then why does he want or recommend substitutes, if cow's milk does so well? even better than well? For the simple reason that if people would feed their own cow's milk, they would not purchase Nestle's; and in order to induce them to do the latter, he tells you that your cows may be tubercular, may be fed improperly, their milk may be adulterated with water, or may contain disease germs. Nestle's cows are not tubercular, we have to infer, are not fed improperly, their milk cannot be adulterated, nor does it contain disease germs—indeed not. For it is the milk of *Swiss cows*, with such a halo round their horns, that even that public-spirited institution, called St. John's Guild, of New York, publishes an advertisement of Anglo-Swiss food, on the last page of its pronunciamento on the bringing up and feeding of little children, which is distributed gratuitously, or for an annual contribution of three dollars.

We are assured that Nestle examines his materials very carefully, uses bread only made of the very best wheat, and the crust only; and that the starch is transformed into dextrine and sugar, under a pressure of a hundred atmospheres, by overheated steam. Thus Nestle's food is not only the very best nutriment for infants, but also for mothers who would fain raise a supply of milk in their own breasts, though it appears that that would be an uncalled-for desire in the face of all that is said about Nestle's food being a perfect substitute. All of which is respectfully submitted by Mr. Nestle's prompter, Prof. Lebert, or, perhaps, rather by Prof. Lebert's prompter, and most of which is untrue.

Many years ago, fifteen or more, when Nestle and Lebert discharged their pamphlets, advertisements, and agents upon America, I was induced to try and employ Nestle's food; I could not say that in children

of a few months or a year it did any harm; on the contrary, it was fairly tolerated by most of them. I consented even to add my name to those of others recommending the article—the only time I ever did so in my life. A few years after, another advertisement appeared which advised, rather against the purchase of the former preparations and recommended the recent modification. It was then, at last, that I resolved to scrutinize what I had recommended in good faith without any examination. I found, 1, that the contents of a number of boxes did not closely resemble each other; 2, that the main substance was made up of starch; 3, that even the cell membranes were not equally crushed, and a great many not changed at all. It has also been found, and urged mainly by Eliza McDonogh (*Inaug. Diss.*, Zurich, 1877), that the fragments of the microscopic elements exhibit the appearance of mechanical destruction, and not that brought about by heat. J. Miescher also states that he finds no essential difference between Nestle and common flour. Iodine yields instantly its blue reaction; the starch elements are partly free, partly still locked up in their cells. Some particles are albuminous, they turn yellow with iodine. In his experiments the watery extract was alkaline, in those of McDonogh it was acid, and contained but little dextrine. Cnyrim found in the boxes examined by him, sugar and dextrine to the amount of 45.56 per cent., but still 20.76 per cent. of starch were left without any change whatsoever. And the result of Jacobsen's examinations is that the contents of the boxes are not alike.

Gerber, also a large advertiser, and Nestle's Swiss rival in America, claims to have improved Nestle's flour by a difference in the process of preparation; the methods of which, however, are not communicated. His flour is wheat, which is again praised as the one article containing all the material required by the growing body in the smallest possible bulk. The same enumeration of the elements is made of an organic salt, and their mixture with organic substances is spoken of as if it were a new discovery. Potassium and phosphatic combinations, albuminates, carbon hydrates, fats, are whirled about in the most impressive and bewildering manner by every one who has a cheap article for sale at a high price. The greatest stress is always laid on the presence in the article offered for sale of all the chemical elements necessary for the building-up of the body. But that presence alone, I repeat, is not sufficient; chemical figures and equivalents still enjoy too much respect and a sort of superstitious veneration. A *thorough preparation preliminary to digestion* is required, though the proportion of elements in a mixture were ever so appropriate. In regard to wheat, however, *this proportion is not the very best* at all, for wheat contains more starch than do barley or oat-meal.

In regard to both of them, Nestle and Gerber, Drs. Altherr and Lorch, in a little book entitled "On the Weighing of Infants for the purpose of determining the Nutritive Value of Woman's Milk, Cow's Milk, Nestle's and Gerber's Flours, and Liebig's Soup," Erlangen, 1877, have no great praise to bestow. Both are declared to be improper foods for the newly born and infants in the first few months; but they admit in the later months of life, when farinaceous foods of all kinds are well tolerated, they also may be given in the same manner. Similar observations have been made in the Child's Hospital, at Berne, Switzerland; and similar remarks are due to the *Anglo-Swiss Food*, which contains milk, some gluten, and plenty of starch, like the others.

In all of the twenty-two European infant foods examined by Eliza McDonogh, the starch was never changed to such a degree as to render the recognition of its source impossible. Wheat, corn, rye, barley, could always be recognized under the microscope. A number of the granules were broken up it is true, but many more were intact. Thus, not even the very exact and uniform distribution of the starch is accomplished. All of them consist of baked flour of some kind, either by itself or mixed with sugar, milk, or salts. There are some, however—for instance, that of Hartenstein—consisting of wheat and oats, which has not even undergone the baking process.

Part of these European preparations have been naturalized with us. Some have made a great reputation, and probably money for many beneficent manufacturers, agents, and salesmen. But they are not alone in the field. Saul slew a thousand, David ten thousand. Europe has twenty odd infants' foods, America more than twice that number. Infants must no longer complain of lack of interest roused in their behalf.

Nature is the same all over; the nature of all natural things alike; that of wheat, oats, and manufacturer, wherever they be found. Thus the same results in regard to the composition of "infant foods" are reached here as in Europe. But a few days ago I was pleasantly surprised by the brief statements of Dr. E. Cutter, who, for *Gaillard's Medical Journal* (Jan., 1882), has undertaken the task of studying (microscopically) all the infant foods in our market. His researches, naturally, refer mainly to the proportion of gluten to starch. And some of his statements I shall refer to here, desiring to give them the greatest possible publicity. I wish the brief article of his would be distributed in a hundred thousand copies, reprinted in every secular paper, read from every platform and pulpit of the land. For it is time that fraud should be stopped, and a nefarious trade suppressed.

Amongst the better preparations are *Mellin's Food*. It claims to be the only substitute for mother's milk, and not farinaceous. It is not the only substitute, but the starch is converted into dextrine, as in *Horlick's Food*.

Franklin Mills Wheat Flour contains more gluten than most of the rest. So does *Arlington Wheat Meal*, which is ground coarsely, and contains much gluten. Also *Hawley's Liebig's Food*, which contains wheat gluten cells, barley gluten cells, barley tegument, wheat starch, and cooked granular masses, which do not polarize light.

Mead's Mulled Wheat Flour, a coarse flour or meal, which does not polarize light well; a good preparation.

Baby Sop is made of unhulled oats, malted and crushed, and contains all its elements; gluten cells of characteristic shape, and starch grains smaller than those of wheat.

As you descend the ladder, there is *Keasbey & Mattison's Infant's Food*. No gluten cells; consists of grape sugar and dextrine, and claims to contain alkaline phosphates.

Mother's Breast-milk Substitute is better than its ignorant advertisements; it contains gluten cells, bundles of wheat starch, barley starch, and gluten granules.

Imperial granum, the salvator for invalids and the aged, an incomparable aliment for the growth and protection of infants and children, a superior nutriment in continued fevers, and a reliable remedial agent in all diseases of the stomach and intestines; that which makes strong bone and muscle; that which makes good flesh and blood; that which is easy of digestion, never constipating; that which is kind and friendly to the brain; and that which acts as a preventive of those intestinal disorders incidental to childhood—Imperial granum food, which claims that the starch, impurities, and soluble matter are effectually excluded, and that the gluten only is retained, *shows no gluten cells under the microscope*, and is no better than it should be, no better than common flour, which, when fine and white,

is deprived of three-fourths of its gluten, and no better than *Savory & Moore's Food*, which is also like common flour. (E. Cutter.)

Ridge's Food is advertised as "a perfect food for infants." Ephraim Cutter tells you how perfect a food it is. It contains the beard of wheat, wheat starch mass, starch bundles apparently of maize, caked mass of starch which does not polarize light, starch grains, starch granules, and small gluten granules. And he adds: "The proprietors must add gluten cells, at least in the proportion found in wheat or maize, to bring the product up to the standard of wheat flour."

Crosby's Brain and Nerve Food, which claims to be composed of vitalized phosphates from ox-brain and wheat-germ, consists almost exclusively of starch. There are no characteristic gluten cells, no nerve-fibre, no axis cylinder fibre, no ganglion, nor multipolar cell. The advertisement claims that the brain is that of the ox, but the label states that the brain is that of the fish. Label advertises 730 parts of starch in 1000, claims some gluten; if this exists, it is the granular gluten of common flour. There are 270 parts of so-called vitalized salts asserted to be in this food; that is, salts in connection with the organic substances named. If this *be so, all the albumenoids in all the foods* in the market are vitalized, also. There is but little gluten, if any, in this food. (E. Cutter.)

Blanchard's Glutena, 90 per cent. of starch, 10 of gluten, the reverse, exactly, of the claim made for the food.

Blair's Wheat-food, abundance of starch, no gluten.

Redmond's Cerealine, starch, very little gluten.

Durkee's Glutena, wheat, almost exclusively starch.

Farwell's Gluten Flour is advertised as "gluten left behind after the starch is blown out," contains starch, almost no gluten.

Victor's Baby Food is *said* to "resemble mother's milk closely," and *is* like cracker and biscuit ground up.

Taylor Brothers' Pure Bermuda Arrow-Root consists of *potato starch*, with an occasional addition of arrow-root.

Hubbell's Prepared Wheat, almost exclusively of starch.

No gluten is contained in *New York Food Company's* cold blast flour, barley flour, buckwheat flour, India wheat flour, Lost Nation wheat flour, Common Minnesota flour, Hazleton flour, Puritan flour, Patapsco flour, Underwood flour, fine granulated wheat flour.

Gluten Flour, New York Health Food Company, is common flour. The most superficial examination exhibits starch in abundance.

After all this, with all my heart I assent to E. S. Gaillard's editorial remarks, which are as follows:

"It is almost criminal that such great questions, affecting the health, and, therefore, the happiness and wealth of a nation, should be left to the ignorance of the miller and the baker; to the foolish customs of society, to the equally foolish test of the mere appearance of bread, and to the fashionable restaurants and hotels. Manufacturers of foods for the sick, and, above all, for infants, should be held to the strictest accountability. It is the highest duty of the physician to learn the facts in regard to meal foods, and to use his information for the benefit not only of the sick, but of the whole community." And experience shows, that as the committee report referred to expressed it last year, the community insists, with the utmost pertinacity, upon giving their babies, as soon as weaning time arrives, or before, such articles of food as they know nothing about. When an adult sits down to a meal and finds placed before him articles of food with which he is not familiar, he makes inquiries in regard to such articles before eating them. The baby, however, is credulously fed upon things with which the child, father, mother, or doctor has not the least familiarity; all of these foods which are sold in large quantities have a composition which is unknown to the public. When a manufacturer deigns to say anything about his merchandise, it is to the effect that the food offered is the best in the market, that it is the proper thing and only thing for children and invalids of all ages, that the relation of the albuminous substances to carbo-hydrates is exactly correct, and that a package costs a certain amount of money. In regard to this subject the public appear to be smitten with absolute blindness. They insist upon forgetting that the man who offers for sale, and advertises at a very heavy expense, does so, as society is constituted, for his pecuniary advantage solely. To say that when the article offered is not good it will find no market, is deceiving yourselves, experimenting on your baby, relying on the character of a single man or corporation, on the honesty or intelligence of the manufacturer's chemist, or his superintendent, or his workmen, on the nature and condition of the elements used in the composition of the article, and on ever so many influences, which can work before the manufactured article gets into the hands of the consumer. Why the sellers and advertisers of unknown compounds should be more trusted than those who raise and sell a simple article of food, such as milk, which is constantly adulterated, can hardly be perceived. Is it necessary to say that the factory furnace is lighted more in the interest of the proprietor than for the benefit of the public?

Still, in regard to the growing evil, which has assumed vast proportions, the profession is at fault, to a certain extent. There are but few but are aware of the inexpediency and sometimes danger attending the exclusive feeding of cow's milk, and look for substitutes. Examples of infants thriving on almost any food are numerous; the public taste runs in the direction of the unknown; thus the responsibility of advice or assent is but a slight one; many of the foods in the market come in a pleasant form and convenient for use; thus the food-business firm certainly thrives. Professional men have become used to look upon the sale of patented foods as something quite unobjectionable. Those imbued with the strictest sense of ethics, who would not patent an invention, nor tolerate the fellowship of a professional man who so does, who frown upon patented medicines, because they are unknown and unknowable compounds, who object to reducing medical science to a mercenary standpoint, these very men forget their habits and principles when the question of patent-right and secrecy comes up in regard to patent foods. If I add, that many of the scientific journals of Europe, particularly those in Germany, dedicated to the study of children's diseases, are frequently used for the purpose of discussing the merits and effects of some new infant foods, it is only to show to what extent the evil has grown.

No profound thinking is required to appreciate the fact that a great many of the articles offered for sale are unmitigated frauds; and that a few are available compositions. But the very fact that they are compositions, that everything organic may spoil, that every compound depends on too many circumstances which are apt to interfere with its uniform condition, and that when you rely on a compound, you rely at the same time on a proprietor, his foreman, his workman, his chemist, you feel that you are easily deceived or disappointed. Besides, for an article, the constituents of which you can purchase at a low price, you are taxed to an inordinate extent.

And why all this? Because cow's milk is found to be defective, when compared with mother's milk. These defects I have pointed out. It contains too much fat, and too much caseine, the latter of abnormal condition. Instead, however, of correcting the faults of milk,

the latter is simply superseded and exchanged for something else. Is potato starch or even wheat, more similar to mother's milk, than is that of the cow? Now the proportions of fat and caseine can be regulated by the addition of water; but dilution is not the only function of the water added to the milk; the digestibility of the latter is also increased.

When albuminous material is subjected to artificial digestion with pepsin, and the process ceases, it recommences when more water is added. When the amount of water in the mixture is large, digestion will take place in a lower temperature than without it. Many digestive disorders in the living are due to lack of water, particularly in infants, who seldom or never are supplied with it in addition to what they obtain in their regular food. Infants who are apt to perspire much, either well or rachitic, who are kept in warm beds most of the time, who are exposed to summer heat, and lose much moisture through their skin, ought to be offered water a great many times in the course of the day. Particularly fat infants, who are mostly developing a rachitic or scrofulous disposition, ought to drink plenty of water. It accelerates tissue changes, and, therefore, animals which are to be fattened are habitually deprived of water. The rule then holds good in infant alimentation, that food, whatever it be, shall be given in considerable dilution.

But in the face of all the advantages water has, it is by itself not the proper dilution for the *caseine of cow's* milk. Some admixture must be found which is apt to overcome the dense coagulations of caseine referred to before. The particles of caseine must not be permitted to remain in close juxtaposition, but separated from each other to such an extent that coagulation in the stomach will take place in small loose flakes of the kind presented by curdling mother's milk. This object is accomplished by all farinaceous substances, without regard to their large or small percentage of starch; also by gum arabic, and gelatine. Of the farinaceous substances, I have but two to recommend, barley and oat-meal. And for good reasons. The starch they contain is more easily dissolved and transformed by saliva than that found in wheat, which is the stock in trade of the infant-food manufacturers. And, moreover, there is less of it in them than in wheat.

The barley and oat-meal are the two substances I mostly employ, as their chemical constituents are nearly alike, with the exception of a large portion of fat in oat-meal, which is not found in barley. Barley water, or thinned and sweetened oat-meal gruel, may be given to the child even at the breast. The indications for the use of one or the other lie in the condition of the infant. Where there is a decided tendency to constipation, I prefer oat-meal; where there is no such tendency, as usual, or perhaps even a tendency of the bowels to be loose, I employ barley. The "prepared" barley is a good preparation for older children only, for the whiter it is the larger is its percentage of starch. It is safest, as no mistake or deception can then take place, for every mother to grind the whole barley in a common coffee-grinder of her own. The younger the baby the more advisable does it become to boil the whole barley for hours, to secure the contents of the bran. A teaspoonful of either is boiled in from five to eight ounces of water, with some salt, for twelve or fifteen minutes, the decoction to be quite thin for very young infants, thicker for later months, and then strained through a linen cloth. Infants of four or six months are to have equal parts of this decoction (which ought to be made fresh for every meal), and of boiled cow's milk; some sugar besides. At an early age, the thin decoction, at a later, the milk ought to prevail in the mixture, which ought to be given at a temperature of 80–90°. The newly-born, which has to wait some days for his spring to open for him, is best fed with a mixture of from four to (in summer) six parts of thin barley water, and one part of boiled milk. A baby of two months will take the same mixture in the proportion of from two or three to one.

I beg leave to quote a single author. Biedert, a conscientious worker, the author of competent contributions to medical science, and particularly to infant hygiene, himself the inventor of a cream mixture for the use of well and sick infants, expresses himself in the following manner in the very circular accompanying his preparations: "The first demand on a method of nourishing infants must be this—that the nutriment is tolerated by all infants, including the feeble and sick, in a manner similar to mother's milk. Now I have found that a food coming up to this requirement, must not contain more than 1 per cent of caseine. Accordingly, cow's milk must be diluted with an indifferent thin decoction (oat-meal or barley.) In the beginning, the dilution must be in the proportion of 1 to 3 or 4; this admixture must be gradually reduced. This is the very mixture which surpasses all compounds thus far recommended, and all the artificial preparations." And still in the face of this testimonial, than which I do not wish a more positive one, he invents a cream mixture.

Though my remarks must necessarily draw to an end, I must not close without at least *one additional word* in regard to some other constituent of infant food, Beside sugar, which is required both by taste and physiological necessities, the addition of common table-salt in moderate quantities both to cow's milk and to farinaceous substances is advisable.

The addition of chloride of sodium to the food is the more important the more the milk is mixed with a vegetable decoction. Carnivorous animals crave no salt; herbivorous, however, a great deal, although in their food the *absolute* amount of chlorine and sodium is as large as in that of the former. They are easily drawn by hunters into fields and woods strewn with salt; and the instinct of mankind has early taught how to add more salt to herbaceous than to animal food.

We find that the craving for salt grows in proportion to the amount of potassium salts contained in the food. In that of herbivores there is twice or even four times as much potassa compared with its chloride of sodium as in that of carnivores; potatoes, with their large amount of potassium, combined with chlorine and phosphoric and citric (pomic) acids, necessitate the addition of large quantities of chloride of sodium. In the food of carnivores, however, who eat whole animals, one equivalent of potassium is nearly balanced by one of sodium and one of chlorine.

Potassium salts and soda salts both exist in the blood, the former principally in the blood-corpuscles, the latter entirely in the serum or watery part of the blood. There is chloride of potassium in both corpuscles and serum, but phosphate of potassium in the corpuscles alone. Now if there should ever be in the blood more phosphate of potassium than can be taken up by the corpuscles, it will be immediately decomposed by the chloride of sodium in the serum—chloride of potassium and phosphate of sodium are formed, and these are both rapidly eliminated by the kidneys, and pass away in the urine. By this means, chloride of sodium is carried away, and must be replaced: in other words, vegetable food requires the addition of a great deal of salt.

The substitution of cow's milk for woman's milk necessitates the addition of salt, for a similar reason; for while 1000 parts of human milk contain only 0.70 chloride of potassium, 1000 parts of cow's milk contain 1.30

There may be infants—I have been told of more cases than I have seen myself—who do not bear barley.

Others may not bear oat-meal. If so, or if for some reason or other it is wise or whim to discontinue them, it must not be forgotten that, though feeding a breastless child *without* cow's milk, appears preposterous, feeding with cow's milk *alone* is dangerous. I do not permit it. I want an admixture at all events capable of diluting, as it were, the caseine. For that purpose, and for that alone, I formerly recommended gum arabic or gelatine. However, our knowledge of these substances has since improved. Prof. Uffelmann, in Rostock, had a little patient, otherwise healthy, who carried a gastric fistula. Through a large opening in his abdominal and stomach wall, he experimented on the child's digestion. Unmistakable and numerous observations taught him that both arabic gum and gelatine are not only emollient and soothing, but directly nutritious. Thus the list of those substances which may be added to boiled cow's milk, to make it available as the regular food for infants, is by no means small. They all come up to the requirements we look for in such substances. They must be perfectly simple and recognizable. They must be accessible, and for sale everywhere. The mode of preparing them must be perfectly simple and easy. They must be cheap.

They must be as nearly the substitute of mother's milk as an imitation can be like the original. They must be alike for throne and den, for Fifth Avenue and Mulberry Street, for the wet-nurses for the throne and for Fifth Avenue come also from the dens and from Mulberry Street. It is not wise to forget that nature is republican in principle and democratic in practice. If too often there be no equality before a court of so-called justice, *there is* equality before that of physiological law.

CARTWRIGHT LECTURES.

ON THE EXPERIMENTAL METHOD IN MEDICAL SCIENCE.

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LECTURE III.

NERVOUS DEGENERATIONS, AND THE THEORY OF SIR CHARLES BELL.

(*Concluded from p. 149.*)

WE will now pass to the second topic for the evening, namely, Sir Charles Bell's Theory of the Nervous System.

Sir Charles Bell's theory of the nervous system is of so recent a date, comparatively speaking, that its traces have not entirely disappeared from our nomenclature. The student will still find among the synonymes in some anatomical text-books such names as the "respiratory nerve of the face," or the "superior and external respiratory nerves of Bell." But the system of which these names formed a part has become so obsolete that their former significance is hardly remembered, and even the distinctive features of the theory itself have been forgotten in the discussion of more important topics connected with the nervous system.

Among the eminent medical men of the present century, perhaps none have attracted more cordial admiration than Sir Charles Bell. His earnest and strictly professional ambition, his restless mental activity, his versatility of talent, and his genial and enthusiastic disposition secured him a rapid success and a position of acknowledged superiority. "Anatomist, surgeon, author, artist, and critic," he taught anatomy by lectures and demonstrations, was the equal of Cooper and Cline in practical surgery, published his magnificent works on the *Operations of Surgery* and the *Anatomy of Expression*, illustrated by himself, and created the reputation of the Middlesex Hospital as a centre of medical instruction. When he received the Order of Knighthood, in 1831, at the same time with Herschel, Babbage, and Brewster, he thought more of his companions than of his title. "The batch," he said, "makes it respectable." He always retained a strong attachment to his early friends and family relatives, and to the pleasures and sports of a country life; and if he experienced some disappointment in regard to the success of his scientific opinions, this was fully compensated by his general popularity and his high professional reputation.

Bell's attention was especially attracted to the nervous system in 1807, a few years after his arrival in London, and while occupied as lecturer in a private medical school, established there by himself. In his demonstrations, he was struck with the apparent complexity of the nervous apparatus, and the difficulty of presenting it fairly to the comprehension of his audience. His mind dwelt persistently on this subject, with a view of reaching some more simple and intelligible arrangement of what seemed confused and disconnected. His thoughts were first directed to the anatomy of the brain, which, he says, at that time "occupied his head almost entirely."[1] He puzzled over the varied form and structure of the cerebrum and cerebellum, the processes, protuberances, and ganglia at the base of the brain, and the connections and course of the different cranial nerves. He tried to reduce these complicated parts to something like order in his mind, and to divine the secret of their anatomical relations.

This was the origin of his new system in cerebral anatomy, and when once it had assumed a distinct form, it grew in importance, and took entire possession of his conviction and imagination. He made it the subject of his lectures, and speaks of it in his correspondence with the greatest enthusiasm. "I hinted to you," he says, in a letter to his brother in Edinburgh, "that I was *burning* or on the eve of a grand discovery." "I really think this new anatomy of the brain will strike more than the discovery of the lymphatics being absorbents." "My object is to lecture it, to make the town ring with it, as it is the only new thing that has appeared in anatomy since the days of Hunter, and, if I make it out, as interesting as the circulation or the doctrine of absorption."[2]

Up to this time there is no trace of any experimental investigations by Bell in regard to this subject. His system was wholly inferential, and based on the visible facts of anatomical structure. But a year or two later he felt the necessity of making some experiments, especially as he had formed the intention of printing his views in a pamphlet for private distribution. He hoped, by this means, to elicit the opinion of the representative men of the profession, and to see whether his innovations would be likely to meet with their approval.

Accordingly, in 1810,[3] he records having made two experiments, with a satisfactory result; so much so that he believes he is now about to establish his system on facts "the most important that have been discovered in the history of the science;" and in 1811, his essay was printed, under the title, *Idea of a new Anatomy of the Brain*, submitted for the observations of his friends, by Charles Bell, F.R.S.E.[4]

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[1] Letters of Sir Charles Bell, selected from his correspondence with his brother, George Joseph Bell. London, 1870, p. 117.

[2] Letters of Sir Charles Bell, pp. 117 and 118.

[3] Letters of Sir Charles Bell, p. 170.

[4] Reprinted in the Journal of Anatomy and Physiology. Cambridge and London, 1869. Vol. iii., p. 153.

The idea developed in this essay, and the importance attached to it in the mind of its author, can be best understood from Bell's own account of its origin and growth. In a letter to his brother, a year before, he details his plan of investigation and the object he wished to accomplish. He had already reached the conviction, on anatomical grounds, that the several divisions of the encephalon were different from each other in function, and especially that a wide distinction of this kind existed between the cerebrum and the cerebellum. But how gain access to these deep-seated and vascular parts, so as to experiment upon them? This seemed too difficult an undertaking. It might be possible, however, to expose for that purpose the spinal cord and its nerve roots, and this is what he accordingly did. "It occurred to me," he says, "that as there were four grand divisions of the brain, so were there four grand divisions of the spinal marrow: first, a lateral division, then a division into the back and forepart. Next it occurred to me that all the spinal nerves had within the sheath of the spinal marrow two roots: one from the back part, another from before. Whenever this occurred to me, I thought that I had obtained *a method of inquiry into the functions of the parts of the brain.*"[1]

That is to say, experiments on the anterior columns of the spinal cord, or the anterior nerve roots, would throw light on the functions of the cerebrum, with which they were anatomically connected; experiments on the posterior columns of the cord, or the posterior nerve roots, would indicate the function of the cerebellum, to which, he thought, these parts belonged.

These are the experiments described in the *Idea of a New Anatomy of the Brain*, and this is the meaning attributed to them by its author. He found that irritation applied to the anterior part of the spinal cord produced contraction in the voluntary muscles; while a similar injury, inflicted on its posterior part, did not do so. On laying bare the roots of the spinal nerves, he could cut across the posterior fasciculus without convulsing the muscles; but touching the anterior fasciculus at once produced convulsions. "Such were my reasons," he says, "for concluding that the cerebrum and cerebellum were parts distinct in function, and that every nerve possessing a double function obtained that by having a double root."[2]

The distinction made by Bell between the two divisions of the encephalon is this: The cerebrum is the organ of the mind, of conscious sensation and volition. Consequently, the anterior roots of the spinal nerves, being connected with the cerebrum through the anterior part of the spinal cord, are subservient to both sensation and volition, and when artificially irritated cause contraction in the voluntary muscles. The cerebellum, on the other hand, presides over the secret or unconscious operations of the bodily frame, as in the vital action of the internal organs; consequently, irritation of the posterior columns of the cord, or the posterior nerve roots, has no perceptible effect on the voluntary muscles. A spinal nerve, accordingly, possesses two roots because it performs two sets of functions: one, those of consciousness and volition, derived from the cerebrum; the other, those of unconscious vital influences, derived from the cerebellum. The cranial nerves, however, have for the most part only a single root, and exercise but one set of functions, corresponding to their place of origin. Thus "the eighth nerve (par vagum) is from the back portion of the medulla oblongata, which belongs to the cerebellum; the ninth nerve (sublingual) comes from the front portion, which belongs to the cerebrum. The first is a nerve of the class called *vital* nerves, controlling secretly the operations of the body; the last is the motor nerve of the tongue, and is an instrument of volition."[1] This is the substance of the views contained in the essay of 1811.

Bell was much disappointed in the impression produced by this pamphlet. It turned out an "unpropitious experiment," for it "excited no criticism, and threatened to stifle the enthusiasm of the author." Bell himself says, regretfully, that this announcement from which he expected so much, "failed to draw one encouraging sentence from medical men." But we can hardly blame them very much for this apathy. The systematic ideas of the author, however attractive to himself, might not have the same interest for others; and his experimental proofs were certainly insufficient to command belief on their own merits. Indeed, we now know that they do not really bear the significance which he attached to them. The anterior and posterior nerve roots are not connected respectively with the cerebrum and cerebellum; and we cannot use them in our experiments to determine the separate functions of the brain. It was no doubt a suspicion of this physiological non-sequitur that prevented the profession at large from appreciating the pamphlet as its author had hoped.

But notwithstanding this temporary discouragement, Bell afterwards returned to the subject with new vigor, and soon came to regard his former work as only the introduction to a more extended system. In his first essay, the anatomy of the brain was the main subject of the research, the nerves and their distributions being only secondary; but in his theory as afterwards developed, the nerves and their distributions occupied the prominent place. This matter, in 1814, was already, he says, "ripening in his head," and in his lectures on the nerves for that year he promises to "lay open a fine system." Like his anatomy of the brain, this new system increased in importance the more he thought about it. Year by year he enlarged its proportions and seemed to anticipate from it greater results than ever. He gradually brought it into the form of a series of communications to the Royal Society. In 1819 he regarded it as nearly complete, and fully worth the labor it had cost; containing, as he believed, the materials of a grand system destined to "revolutionize all we know of this part of anatomy, more than the discovery of the circulation of the blood." By the time the first paper was ready for presentation he was abundantly satisfied with it, and declared that he had made "a greater discovery than ever was made by any one man in anatomy."

In this communication[2] Bell presented the main principles of his new arrangement of the nervous system with special reference to the nerves of the face. The paper had been prepared by its author with much care, and he offered it to the Royal Society as the result of several years of thought and investigation.

This time he had no reason to be disappointed, as the essay attracted everywhere attention and approval. In speaking of a reception which he attended soon afterwards "my paper," he says, "has done me as much good as if I had bought a new blue coat and figured French black silk waistcoat. One gentleman called it the first discovery of the age." He received a number of complimentary letters in regard to it, which he says were enough to show that he was "not a visionary" on the subject. "It will hereafter," he adds, "put me beside Harvey."[3]

This paper of 1821 well deserved the praise bestowed upon it; for it contained the announcement of Bell's

[1] Letters of Sir Charles Bell, p. 170.
[2] Reprint in the Journal of Anatomy and Physiology, p. 161.

[1] Reprint in the Journal of Anatomy and Physiology, p. 162.
[2] Philosophical Transactions of the Royal Society. London, 1821, p. 398.
[3] Letters of Sir Charles Bell, p. 272.

most lasting and undisputed discovery, namely, that the facial nerve, or *portio dura* of the seventh pair, was not a nerve of sensibility, but was exclusively a channel for muscular action and the nervous medium of expression in the face. The importance of this discovery, both scientific and practical, was abundantly manifest; and it was sustained by direct and satisfactory experiments on the living animal, as well as by observations on the human subject. It is evident that Bell did not get at the whole truth in regard to this nerve; for he represented its action as limited to the involuntary movements of respiration and expression, and considered the voluntary motions of the face and lips as provided for by the fifth pair. But it is very seldom that all the details of so complex a subject are mastered by one person or at one time; and the primary facts of the motor character of the facial nerve and its insensibility, as contrasted with the extreme sensibility of the fifth pair, were then fully established upon incontestable evidence.

Bell, however, was much more interested in the general plan of his new classification, than in any of its details, which he valued mainly as illustrations or proofs of his system as a whole. He continued to develop this system in a series of papers addressed to the Royal Society; and it was afterwards embodied, with some necessary modifications, in his *Nervous System of the Human Body*, published in 1830.

Bell's conception of the arrangement of the nerves was this: All the nerves of the cerebro-spinal system were divided into two great classes or groups. The first group was that of the *regular*, *original*, or *symmetrical* nerves; namely, the thirty-one pairs of spinal nerves and the fifth pair of cranial nerves. All these nerves arise by two roots, upon one of which is a ganglion; they pass out laterally, to successive divisions of the body; they are all subservient to voluntary motion and common sensibility; they are distributed to every part of the frame, but are symmetrical and simple in their arrangement. The second group was made up of the *irregular* or *superadded* nerves. These do not arise by double roots, and have no ganglia at their origins; they come off from the sides of the medulla oblongata and upper part of the spinal cord, and, instead of being distributed regularly to successive parts of the frame, are sent to remote organs, which they combine in functional activity. They, therefore, have the character of being superadded, for a special purpose, to the original system of regular nerves. They constitute the great group of *respiratory nerves*, which are distributed to a variety of organs, and instead of going out on each side straight to their destination, often pass through the body in a longitudinal or oblique direction. They are:

1. The facial, portio dura of the seventh pair; respiratory nerve of the face.
2. The glosso-pharyngeal nerve; distributed to the tongue and pharynx.
3. The par vagum, or pneumogastric; the nerve of the lungs, heart, and stomach.
4. The spinal accessory, or superior respiratory nerve of the trunk; distributed to the sterno-mastoid and trapezius muscles.
5. The sublingual, or the nerve of articulation.
6. The phrenic, or great internal respiratory nerve.
7. The long thoracic, or external respiratory nerve of the trunk.
8. The fourth nerve, or patheticus; distributed to the superior oblique muscle of the eyeball.

These are the nerves which produce the appearance of irregularity or confusion in the nervous system because they often cross the track of the regular, symmetrical nerves, and are distributed to organs already supplied by them.

This last fact gives the key to the functional peculiarity of the superadded nerves. According to Bell, an organ which performs only a single function has but one nerve supplied to it, and whenever an organ receives nerves from two or more sources, it is because it performs as many different functions. This explains why certain muscles, like the sterno-mastoid and trapezius, already supplied with nerves from the regular or symmetrical system, also receives branches from the respiratory system. The former nerves enable them to perform ordinary the acts of voluntary motion; the latter bring them into occasional involuntary unison with the act of respiration. This is illustrated in a still more striking manner by the two nerves distributed to the face; namely, the fifth pair, supplying the face both with sensation and voluntary motion,[1] and the facial nerve, or seventh, a superadded nerve, which controls the involuntary motions of the face in breathing;[2] or, as he says, "when the muscles of these parts are in associated action with the other organs of respiration."

The respiratory nerves, however, come into play, not only in the motions of respiration proper, but in all acts connected with the entrance and exit of air from the lungs; as, in speaking, singing, coughing, gasping, or sneezing. They are also the agents in all movements of expression, or the emotional affections of the frame. This is especially marked in the seventh pair, which regulates the involuntary changes of expression in the face. But it applies also to the manifestations of emotion in other parts; as, in the hurried respiration of anxiety, the retardation or quickening of the heart, and the sobbing of the diaphragm in grief, excitement, or depression. Under every strong impulse the central organs of respiration are stimulated or disturbed, and thus bring into associated action all their subordinate parts, as organs of expression.

Beside this, the nerves of respiration, wherever they may be, have more vitality than other nerves; for the movements connected with this function will continue to be performed after all manifestations of sensibility and volition have disappeared. Thus these nerves form a great system by themselves, distinguished from the ordinary or regular nerves by their mode of origin, their functions, their distribution, and their vitality.

Evidently, there was much of real value in these observations. They placed in strong relief the fact of associated respiratory motions. The expansion and collapse of the nostrils or lips, accompanying the action of the thorax, are occasional in man, constant in some animals, and always increase in proportion to the intensity of respiration. They are truly respiratory motions, as much so as those of the diaphragm. The sterno-mastoid and trapezius muscles are also brought into action whenever breathing is obstructed or laborious. The classification which Bell constructed on this basis, and illustrated with so much ingenuity, has a certain charm about it, and is plainly marked with the talent and originality of its author. But, even as a system, its joints do not all bear inspection, and it contained from the outset certain defects which become after a time plainly perceptible.

Bell showed by his experiments and observations that the seventh nerve controls the involuntary motions of expression and respiration in the face, and that these motions are abolished by its division or injury. If he had accepted this fact for its own value, and had assumed nothing further, he would have been secure. But he believed, in accordance with his system, that these involuntary movements were *the only* ones under control of the seventh nerve, and that sensibility and volition were provided for by the fifth pair. This idea influenced his mind to such an extent that he was led to conclude,

[1] Philosophical Transactions, 1821, pp. 410, 411, 413, 417; and 1822, p. 284.

[2] Philosophical Transactions, 1821, pp. 406, 410, 414.

after division of the fifth pair alone, that the voluntary movements of the lips were paralyzed, while those of respiration continued.[1] Magendie, on the other hand, who believed in nothing but direct experiment, soon afterwards repeated this operation on the fifth pair, and declared that he could not perceive any paralysis of the lips produced in consequence.[2] We now know that he was right, and that the fifth pair does not animate any of the superficial muscles of the face. If that be true, according to Bell's principles there ought to be *two* other nerves distributed to this part; one for its voluntary, the other for its respiratory functions. But, in fact, it has only the seventh pair, which serves for both.

Bell's classification of the respiratory nerves, with regard to their origin, is by no means perfect in its details. These nerves were said to differ from the others in having no ganglia at their roots, and in originating from a middle tract on the sides of the medulla and spinal cord. But both the pneumogastric and glossopharyngeal nerves have ganglia at their roots, which are as real, though not quite so conspicuous, as the Gasserian ganglion of the fifth pair. Again, the origin of nerve roots, in a nearly continuous line, from the lateral tract of the medulla and spinal cord, is certainly a marked feature in the glossopharyngeal, pneumogastric, and spinal accessory nerves. On the other hand, it cannot be asserted, with any plausibility, of the facial, sublingual, and patheticus.

The last-named nerve was associated with the respiratory system because it was regarded as causing the upward rolling of the eyeball in involuntary movements and emotional expressions. Everything connected with this subject had for Bell a great attraction. His book on the *Anatomy of Expression* was his earliest publication in London, and first called attention to him as a man of ability. He gave lectures on the same topic to professional artists, and the exercise of his talent in painting and modelling was always for him a source of pleasure in connection with his anatomical pursuits. This, probably, accounts for the rather forced amalgamation in his theory of the functions of respiration and expression.

But how does it happen that Bell omitted from his respiratory system the *intercostal* muscles and their nerves? One would think they had some claim to be considered as part of this great apparatus. They are constantly at work, and keep time with the diaphragm and lungs more steadily than any other outlying organs of respiration. But the intercostals are part of the regular symmetrical system of nerves, originating from the spinal cord, with double roots, and all the other features of their class. The author ignores this difficulty almost entirely, or alludes to it only so far as to surmise that the branches of these nerves which influence respiration are, "in all probability," derived from the same lateral tract of the spinal cord.[3] But there is not the least evidence adduced in support of this probability, and the assumption looks very much like reasoning in a circle.

The controversy once carried on as to the exact significance of Sir Charles Bell's doctrine and discoveries, was due in great measure to the singular obscurity of his style and his indefinite manner of statement. These defects were habitual with him as a writer, and in many instances are extremely marked. There are few pieces of harder reading than the preface and introduction to his *Nervous System of the Human Body*.[4] In attempting to account for this obscurity, the reader is sometimes left in doubt whether Bell really has any distinct idea to communicate, or whether he voluntarily stops short of its complete expression. One of these puzzling passages is the following. After speaking of the par vagum and the spinal accessory nerve, he says (page 47): "Directed in the next place to the portio dura, I wished to answer the question: Why does the nerve which supplies certain muscles of the face take an origin and a course different from the fifth nerve, destined to the same parts? *Guided by these considerations in my experiments, by inference I concluded* that on cutting across this nerve, all the motions of the face connected with respiration ceased, and that it had the origin we see, and took its course with the respiratory nerves, because it was necessary for the association of the muscles of the nostrils, cheek, and lips, with the other muscles used in breathing, speaking, etc." It is certainly impossible to determine from the phraseology of this sentence whether it contains the statement of an experimental fact or is only the expression of a hypothetical surmise.

Having enumerated again the various organs of respiration, he says (page 49): "It appears, then, that it is the distance and irregular position of the eye, nostril, mouth, throat, and larynx, and muscles of the neck, which require these diverging and apparently irregular nerves to connect them with the act of respiration, and without which they would have possessed no more attributes than the nerves of the limbs; that is to say, sensibility and motion."

There is nothing in the context to indicate from what point the eye, nostril, mouth, throat, and larynx are "distant" or why they should be considered as more "irregular" in position than the limbs.

One of the most curious instances of this peculiarity is a passage in one of Bell's earlier letters, describing his new system of the anatomy of the brain, and I think it hardly probable that any one now present will be able to understand exactly what he means by it. "I consider," he says,[1] "the organs of the outward senses as forming a distinct class of nerves from the other. I trace them to corresponding parts of the brain, totally distinct from the origins of the others. I take five tubercles within the brain as the internal senses. I trace the nerves of the nose, eye, ear, and tongue to these. Here I see established connections. Then the great mass of the brain receives processes from these central tubercles. Again, the greater mass of the cerebrum sends down processes, or crura, which give off all the common nerves of voluntary motion, etc. I establish, thus, a kind of circulation, as it were. In this inquiry, I describe many new connections. The whole opens up in a new and simple light; the nerves take a simple arrangement, the parts have appropriate nerves, and the whole accords with the phenomena of the pathology, *and is supported by interesting views.*"

This indefinite style of expression extends, as in one of the passages just quoted, even to the description of experiments and their results. It is usually thought essential in reporting experiments, especially if bearing on new questions in physiology, to state all the particulars, so that the reader may form for himself some estimate of their value.

Bell habitually neglects this useful precaution. He generally omits all mention of the details of the operative procedure, often that of the species of the animal employed, and sometimes even whether it were living or dead at the time of the experiment. The consequence is, that doubts have been entertained on these points in regard to some of his most important investigations.

The truth is, Bell had no real faith in experimentation as a source of knowledge. He preferred to make his deductions in the first place from the details of

[1] Philosophical Transactions, 1821, p. 413.
[2] Journal de Physiologie, Tom. i., Année, 1821, p. 387.
[3] Philosophical Transactions, 1822, p. 287.
[4] First edition. London, 1830.

[1] Letters of Sir Charles Bell, p. 117.

anatomical structure; employing experiments afterwards to "prove" or "confirm" them, or to impress his convictions upon the minds of others. This is abundantly evident from his own express declaration in various parts of his work, as well as from the method he pursued in originating and carrying out his plans of investigation. With him, the conception of a system was the beginning and the end of the mental process; its experimental evidence was only an intermediate episode. For this reason, Bell would hardly be considered, at the present day, as a physiologist. Indeed, he never speaks of himself as such, but always as an "anatomist," whose whole pleasure is in "investigating structure;" and even his new doctrines and ideas he expressly designates as "discoveries in anatomy."

This explains, in some degree, his undue estimate of the two methods of inquiry. He had so high a regard for the results of anatomical research, that he believed them capable of also solving questions in physiology. Already, in 1808, three years before printing his *Idea of a New Anatomy of the Brain*, he "is sure," he says, "that he is correct," and that was before he had made a single experiment. And long afterwards he declared that the "few experiments which he has made were directed only to the verification of the fundamental principles on which the system is established." But the result of this method has been exactly the reverse of what he anticipated. The experimental observations which he undervalued form the only part of his system which has remained, while the attractive and harmonious classification, which he constructed with so much ingenuity on the basis of anatomical deduction, has now lost its importance and almost its place in medical literature.

The value of the experimental method in medical science cannot be measured by the direct results of any particular discovery. It is true that these discoveries are often of great importance, and increase largely the fund of our medical knowledge. They possess, moreover, a vitality which distinguishes them in a marked degree from the ephemeral products of scientific hypothesis. When a hypothetical system has served its time it disappears, and is replaced by a different one; but the knowledge derived from experiment remains serviceable long after its novelty has passed away. The experimental observations of Galen on the recurrent laryngeal nerves and on the function of the arteries as bloodvessels are as conclusive now as when he first made them, and retain at this day their full value. They have lasted for over seventeen centuries, and have survived during that time all the fluctuating medical systems of solidism and fluidism, of animism, vitalism, archaism, and iatro-mechanism. The information which they imparted was a reality, and is neither destroyed nor impaired by the lapse of time.

But the benefits of an experimental discovery extend far beyond its immediate limits. When a new fact has been established in anatomy or physiology, it is impossible to say what bearing it will have on other facts not yet discovered; and in the history of medicine there are many instances of curious observations which remained imperfect and apparently barren until subsequent discoveries invested them with an unexpected importance. It is evident that Galen's detection of the arterial blood-current in the second century was a necessary preliminary to Harvey's complete discovery of the circulation in the seventeenth; and the lymphatic vessels, discovered in 1651, were thought to be the agents of a slow and insignificant absorption, until Colin found, two hundred years later, that the daily quantity of fluids passing through the thoracic duct was from four to ten per cent. of the entire bodily weight. It is almost certain that a genuine investigation, however isolated at first, will produce, some time or other, its legitimate fruit. But to secure this object there is one essential requisite, and that is, that the experimental method be continued and cultivated for its own results, whatever they may be, without demanding or expecting immediate returns of a kind that can be designated beforehand, and with entire confidence that this method has always been, and will always be, the only source of permanent improvement in medical science.

ORIGINAL ARTICLES.

THE USE OF CONSTITUTIONAL REMEDIES IN THE TREATMENT OF EAR DISEASES.

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(*Concluded from p. 129.*)

AND this brings me to the consideration of those very serious cases in which inflammation originating within the tympanum gives rise to intra-cranial complications, either by direct extension through the thin partition of bone which forms the roof of the tympanum, or indirectly by causing periostitis and caries of the mastoid antrum and cells. In the descriptions given of the treatment of mastoid disease in the works of Dalby, Buck, and Burnett, constitutional remedies (except the recommendation of anodynes by the last named) are completely ignored, and, singular as it may appear, the same is true of the works of Allen, of Tröltsch, and of Roosa. The "treatment of mastoid disease," as described by each of these authors, consists of little else than an account of how and when to perform Wilde's incision and to trephine the mastoid process. But are these, together with the application of leeches and fomentations, the *only* efficient remedies at our command with which to combat this dangerous malady? and must we say, with Dalby, that "where inflammation of the contents of the cranium has actually commenced, the issue of the case is certain?" I think not. If mercury is indicated in periostitis of the tympanum, it is certainly imperatively demanded (unless there be positive contra-indications to its use) when the periosteum of the mastoid cells, or the dura mater covering the roof of the tympanum, is involved in the inflammatory process. Of course, the stage which the malady may have reached when the case comes under observation, will have much to do in determining the propriety of the administration of mercury; but it may be well to utter a word of warning against deciding too hastily that the favorable period for its exhibition is passed, for, if we examine the many cases that have been published in which perforation of the mastoid was performed for the relief of intraosteal inflammation, we shall be surprised to find *in how few of them pus was discovered in the antrum or in the smaller cells;* of course, in a day or two it made its appearance, but how much had the traumatism to do with this?

We have seen in the case related by Dr. Buck what may be accomplished in meningitis dependent upon inflammation of the tympanum, by the timely administration of mercury; and, although I have been so fortunate as to meet with but very few cases of middle-ear disease complicated by serious intra-cranial or mastoid inflammation, I am able to furnish from my own limited experience at least two cases which forcibly illustrate the efficacy of this drug under such circumstances.

The first case, which occurred several years since, was that of a highly intelligent lady, about fifty years of age, of rather delicate constitution, and subject from early life to periodical attacks of severe headache, who

had an acute suppurative inflammation in the drum of the left ear, which resulted in perforation of the membrane and the establishment of an otorrhœa. To check this, powdered alum was blown into the auditory canal (a method of treatment which, under similar circumstances, I would not resort to with my present experience), and the discharge was arrested. Within a few days after this, pain, referred to the left side of the head, made its appearance, and presently mild delirium and well-marked aphasia. These alarming symptoms continuing, in spite of milder measures (which included the application of leeches and the liberal administration of bromides), with the approval of my grandfather, the late Prof. N. R. Smith, to whose wise teachings I owe much of the knowledge that stands me in best stead in dealing with both eye and ear diseases, and especially an abiding faith in the power of mercury to control inflammatory action, a seton was inserted in the left temple, and small doses of the biniodide of mercury,[1] to be taken three times a day, were prescribed. Under this treatment, which was kept up for a considerable time, an amelioration of all the unfavorable symptoms soon became manifest; and finally the aphasia, which persisted in a remarkable and most interesting manner for some time after the disappearance of the pain and delirium, vanished, and the patient's recovery was complete. And to-day she is in sound health, and in the possession of a brain which affords her an intellect of exceptional force and clearness. I should add that syphilis was certainly not an element in this case.

The other case is of recent occurrence—indeed, is still under observation. A man, twenty-three years of age, employed in an iron foundry in this city, came to the Baltimore Charity Eye and Ear Dispensary on the 7th of December, with hearing markedly impaired, and complaining of pain in the left ear. The right ear was blocked, and the left partially occluded, by impacted cerumen, the removal of which, however, did not by any means restore the hearing of either ear. The tympanal membrane of the left ear was opaque, thickened, and presented a sodden appearance; that of the right was somewhat dull, and not of normal translucency. My opinion was, that the deafness not relieved by the removal of the impacted cerumen, was dependent upon chronic middle-ear catarrh, and that the pain in the left ear, which he had felt at intervals for several weeks, was due to a more active inflammation in the tympanal membrane, or perhaps in the drum cavity, caused by the mechanical irritation of the impacted wax. I expected, therefore, that the removal of the latter would be followed by the quick subsidence of the pain, and was surprised to learn, two days afterwards, that there had been no diminution in it. The Politzer bag having been used (more especially to relieve an obstruction of the right Eustachian tube), an anodyne drop, to be instilled into the left ear, was prescribed, and the patient was directed to report in three days. When he returned at the expiration of this time (December 12), I discovered that the left mastoid region had become swollen, red, and very sensitive to the touch, and I learned that the pain, which was now chiefly post-aural, had increased greatly in severity. The appearance of the tympanal membrane, however, had undergone no appreciable change, and the Eustachian tube was pervious to the Valsalva method of inflation, the air entering the drum cavity with a dry, non-perforation sound. The true nature of the malady was now for the first time apparent, and I recognized at once that I had to do with an inflammation of the mastoid cells, evidently brought about by an extension into the antrum of the inflammation which started in the tympanal cavity.

Upon making this discovery, the patient was immediately placed upon biniodide of mercury, $\frac{1}{16}$ gr. to be taken three times a day, and four leeches were ordered to be applied beneath the auricle and just below the mastoid process, free after-bleeding to be encouraged. As there was no fluid in the tympanum, the membrane was *not* incised. Two days after this, although the pain had been relieved by the leeching, there was no improvement in the other symptoms; but, on the contrary, the redness, swelling, and tenderness of the mastoid had increased, a buzzing had begun in the left ear, and the muscles of the left side of the neck had become so sore and stiff that the patient carried his head as in torticollis, and could not, without great suffering, turn it to either the right or the left. If I had been *a thoroughly orthodox* aural surgeon, I certainly would have made, at this stage, a free incision over the mastoid, or perhaps would have opened the antrum. Instead of doing either, however, I gave the patient two powders, each containing four grains of calomel and ten of rhubarb, and directed him to take one at bedtime that night and the other on the following night, and, unless his mouth became sore, to continue the biniodide as before; and the wisdom of this course was made evident when the patient reported two days later (December 16), seemingly a different man,—his head no longer twisted to one side, the post-aural redness entirely gone, and the swelling and tenderness greatly diminished. He had taken the two powders, he said, the first one having acted quite freely upon the bowels, the second one less decidedly, and as he "had a bad taste in his mouth this morning," he had omitted the mid-day dose of biniodide. As there was no evidence of ptyalism, he was directed to resume the biniodide, and to take a third calomel and rhubarb powder at bedtime. On the morning of December 18, the soreness and stiffness of the neck had disappeared entirely, and no trace of the tenderness or swelling over the mastoid remained. The last powder had acted but once upon his bowels, and "yesterday morning," after taking the biniodide, his mouth had felt "a little sore," and he had not taken it since. The drums were inflated by Politzer's method, and he was told to resume the biniodide.

It is unnecessary to give a detailed account of the further progress of this case. Suffice it to say that, continuing the biniodide, commencing on the 23d to use a gargle of iodine and iodide of potassium, and the Politzer bag being used every day or two, he improved uninterruptedly until the 26th, when he indulged in a Christmas frolic—driving in a wagon six miles into the country, drinking "about four glasses of eggnog," and returning after nightfall. As a consequence of which he had for several days a slight return of soreness in the muscles of the neck, and an uncomfortable feeling in the back part of the head. As a precautionary measure, the dose of biniodide was increased on the 28th to $\frac{1}{12}$ gr., three times a day, and on December 31 he was feeling so well that he resumed his heavy work at the foundry, continuing, however, the mercury and the iodine gargle. January 6, he reported himself all right, except a scarcely perceptible tinnitus in the left ear, observable only upon lying down. He had suffered no inconvenience from the biniodide, and his work had produced no unpleasant results. The dose of mercury was reduced to $\frac{1}{16}$ gr. [To-day (January 8), he reports at my office for a careful examination. Since the use of the Politzer bag at his last visit, he has had no return of tinnitus, and he describes himself as feeling perfectly well in every way. The left tympanal membrane is rapidly regaining its normal appearance, and there is no depression of either drum-head. The left ear, which at one time, after the removal of the impacted cerumen, could distinguish

[1] I regret to say no written record of this case was kept, and I am not positive as to the exact dose in which the mercury was given; my impression is, however, that it was not more than $\frac{1}{48}$ of a grain.

the tick of the watch at only 2″, now hears it at 54″; and the right ear, which formerly heard it at but 20″, hears it to-day at 50″; while with each he can understand words and questions spoken in a whisper at 20′ with normal acuteness. Both Eustachian tubes are pervious to Valsalva, and no change in hearing, or perceptible alteration in the position of the tympanal membranes, follows Politzer's method of inflation. The biniodide (which he takes without the slightest inconvenience) and the gargle will be continued for some days longer, as a measure of precaution.]

And now, since my enthusiastic convictions regarding the value in diseases of the ear of the much-maligned mercury have led me to speak at such length of this one agent, I can only briefly allude to the other constitutional remedies which I have employed with advantage in aural practice.

From *iodide of potassium* I have not obtained the decided results which mercury has afforded me; nevertheless, in syphilitic affections of the middle and internal ear it may be substituted for the latter with undoubted advantage in some cases; and when middle-ear changes are associated with a rheumatic diathesis, it is, unquestionably, of service. It should be given in the same doses as when prescribed for other maladies. I have had no experience of the *heroic* method of administering it, but we have the excellent authority of Dr. Roosa for believing in its efficacy in specific inflammation of the labyrinth.

Allusion has already been made to *muriate of ammonia* as a useful remedy in mucous catarrh of the tympanum. Hinton recommends this agent in tinnitus.[1] I have no reason for thinking that it exerts a specific influence upon this particular symptom, but as I have very excellent reasons (from a somewhat extensive use of it) for considering it efficacious in subacute and chronic middle-ear catarrh, and as tinnitus is so often dependent upon one or the other of these conditions, I believe it does in this way frequently relieve this troublesome complaint. To adults I generally give it in ten-grain, sometimes in fifteen-grain, doses, dissolved in two drachms of water, four times a day, directing it to be taken in a little water; to children I give it in five- to eight-grain doses, and often add to the solution a small quantity of syrup of tolu. I would recommend it especially in the secretory or true form of middle-ear catarrh.

Another remedy to which I would direct the attention of those who are engaged in the treatment of ear diseases, is *pyrophosphate of soda*. For a knowledge of the virtues of this medicine I am indebted to Dr. Alan P. Smith. For a number of years he has employed it as an internal remedy in furuncular and carbuncular inflammation, in eczema of the auricle, or upon other parts of the body, and, indeed, in almost exactly the same conditions in which sulphide of calcium has been recommended. He regards it as a remedy of great value, and tells me he has frequently obtained very positive and unmistakable results from it. My own experience with it has not been very extensive, but I am sure I have seen it do good in furuncles in the auditory canal, and in acute suppurative inflammation of the middle ear, and I am certain I have seen hypopyon diminish under its influence—a crucial test of its powers. It should be given dissolved in water, in doses of from ten to twenty grains every two, three, or four hours, according to the urgency of the symptoms. It is not very soluble, so that in prescribing it at least half an ounce of water should be ordered to each twenty grains of the salt.

As to the efficacy of *sulphide of calcium*, of which Ringer speaks so decidedly, and to which Dr. Sexton has recently directed the attention of aural practitioners, I am not yet prepared to give a positive opinion. In some cases of furuncular inflammation of the auditory meatus, however, it has seemed to exert an influence for good which could hardly be doubted.

My experience with *arsenic* (Fowler's solution) in eczema of the auricle and auditory canal leads me to look upon it with more favor than some authorities are disposed to regard it. I consider it applicable, however, only to the chronic forms of this affection.

Almost all writers upon diseases of the ear have something to say concerning the usefulness of *cathartics*. Those which contain *calomel* are, according to my experience, the ones to which the aural physician may resort with the greatest confidence. I have inherited a partiality for a powder composed of calomel, rhubarb, and scammony (calomel, powdered scammony virg. āā 2–4 grs.; powdered rhubarb, 5–10 grs.); it is not a pleasant mixture to take, and with children and fastidious adults I sometimes give simply the calomel in two or three teaspoonfuls of syrup of rhubarb. Of the great good which may be accomplished by the administration of three or four such powders, at intervals of from twenty-four to forty-eight or more hours, according to circumstances, in very many cases of acute eczema of the auricle (especially that variety which we see so often in children asspciated with so-called *strumous* ophthalmia), of diffuse and furuncular inflammation of the auditory canal, and of simple and complicated acute otitis media, I do not need to speak with hesitation, as I have seen it demonstrated upon too many occasions.

It is scarcely necessary to allude to the value of *tonics* in many affections of the ear. I would, however, call attention to the excellent results which may be obtained from the *phosphates of iron, quinine, and strychnine in combination*,[1] in otorrhœa and in eczema of the external ear, especially when they occur in delicate children.

Although I have tried the various remedies which have been suggested at different times for the relief of tinnitus, such as *bromide of potassium, hydrobromic acid, ergot, belladonna, nitrite of amyl*, etc., I regret to say I have not obtained very decided results from any one of them. When this symptom is dependent *solely* upon hyperæmia of the labyrinthine vessels, the bromine combinations and ergot, especially, ought to exert a beneficial influence; in the more obstinate cases, however, this is, in all probability, not the usual, or at least not the sole cause, but there are others, such as anchylosis of the foot-plate of the stapes to the margin of the oval window, thickening of the membrane of the round window, etc., which, of course, are beyond the reach of such drugs.

As I have no especial suggestions to offer regarding the internal administration of *anodynes*, and as almost every work upon the ear commends their use when occasion requires, I will content myself with this brief allusion to them, and so avoid prolonging unnecessarily this already too prolix paper.

There is a tendency upon the part of all specialists —whether medical or not—*to become too highly specialized*. In the specialist who devotes himself to the study and treatment of diseases of the ear, the otologist, this tendency is manifested most conspicuously in a disposition to *over-estimate the value of purely local measures*, and to *under-estimate the value of constitutional measures*, in the treatment of the maladies with which he has to contend. In calling attention to this shortcoming of his, I believe I have not done a work of supererogation.

[1] Supplement to Toynbee's Diseases of the Ear. H. K. Lewis. London, 1868, p. 464.

[1] I employ a syrup prepared by Messrs. Sharp & Dohme, of Baltimore, containing in each fluidrachm, phosphate of iron gr. j, phos. quinia gr. j, and phos. strychnia $\frac{1}{32}$ gr., giving to children from 15 to 30 drops, and to adults one teaspoonful three times a day.

MEDICAL PROGRESS.

HEATON'S OPERATION FOR THE RADICAL CURE OF HERNIA.—In the *Boston Medical and Surgical Journal* for January 12, 1882, Dr. GEORGE W. GAY reports 15 cases of hernia in which he employed Heaton's method of injecting the fibrous tissue of the inguinal canal and ring with a preparation of white-oak bark, and applying pressure by means of a compress and bandage to keep the canal closed, and prevent the descent of the hernia until the contracted tissues become strong enough to support the strain imposed upon them. Of these cases 4 were cured; relieved, 8; not relieved, 3. Number of ruptures, 18; cured, 5; relieved, 8; not relieved, 5. Number of operations, 23.

With two exceptions, the above cases seemed to be favorable ones for the operation. That it was not more successful may very likely be due, in part, to the lack of skill and experience in the operator; in part to the imperfect after-treatment, especially in several instances, occurring in the out-patient department of the hospital; and, finally, to the fact that a second operation could not be obtained in several cases, in which not quite sufficient contraction resulted from the first.

While Dr. Gay does not feel justified from his limited experience, extending over only four years, in expressing a decided opinion as to the real value of the oak-bark treatment of hernia, yet his impression is that in the inguinal variety of the affection it is often a good method, and is worthy of further trial and study at the hands of competent surgeons. It would seem peculiarly adapted to cases with small rings, and to cases occurring in children, when nature herself is making a constant effort to correct the deformity, and requires but little assistance to enable her to accomplish the result.

Nothing is stated as to the merits of the operation in other kinds of hernia; but in the one under consideration it can be concluded that it is safe; it is not very painful; it is not very difficult to perform; it does little harm, even if it does no good; it will cure a certain number, and will relieve others.

BENZOIC ACID IN RHEUMATISM.—In acute articular rheumatism, Prof. SENATOR prescribes benzoic acid in preference to salicylic acid. He gives it in doses of from two and a half to three drachms, and benzoate of soda in doses of from three to three and a half drachms, daily. In more than twenty cases of which observations are reported, cure has taken place rapidly under the influence of these drugs, without complications or relapses. They are not, however, equally efficacious in subacute or apyretic rheumatism.—*L'Union Méd.*, Jan. 14, 1882.

LOCOMOTOR ATAXY IN SEWING-MACHINE OPERATORS.—M. GUELLIOT has made a study of two cases of locomotor ataxy occurring in sewing-machine operators, and concludes:

1. That in cases of hysterical women, in whom a predisposition to locomotor ataxy exists, work on the sewing machine may occasionally be the cause of the development of the disease.

2. The symptoms appear first in the lower extremities, and gradually ascend. The darting pains occurring in flashes in the limbs from below upwards.

3. Under the influence of repose, a rapid improvement, which may be of long duration, is generally observed.—*L'Union Méd.*, Jan. 10, 1882.

LONG INTERVAL IN THE BIRTH OF TWINS.—Dr. BARANSKI reports the case of a woman who was easily delivered of an imperfectly developed male child and its placenta, and who, finding herself doing well, recommenced her ordinary house-work. While working in the fields, seventeen days after the birth of her child, a fresh discharge of liquor amnii occurred, unaccompanied by pains. Dr. Baranski was called to her the next day, found an arm presenting, and delivered her of a well-developed and unmacerated child. The placenta followed spontaneously.—*Centralb. f. d. Med. Wissen*, Dec. 17, 1881.

RELATION OF THE TERMINATIONS OF THE MOTOR NERVES WITH MUSCULAR CONTRACTION.—M. CH. RICHET, at the meeting of the Société de Biologie, November 26, 1881, presented some facts which may serve to explain the rôle of the motor-nerve terminations in contracture and in the muscular function in general. When a limb, in a condition of contracture, is deprived of blood, the contracture disappears in from three to four minutes; the muscle, however, still remains excitable. The nerves also preserve their irritability longer than is generally supposed; to demonstrate this, it is necessary to experiment with the sensory, and not with the motor, nerves, since the motor plates of the latter being paralyzed, no effect could follow their stimulation; thus, in dogs in which the circulation is completely excluded from the limbs, sensibility may remain for from two and a half to three hours. It therefore follows, that if the nerve and muscle preserve their irritability for such a time, when the contracture rapidly disappears it must be due to a paralysis of the motor-nerve terminations, whose vitality resembles that of the nerve cells. In retarding the circulation in the arm by a rubber band, the voluntary movements become almost immediately feeble and irregular.—*Gaz. Méd. de Paris*, Dec. 10, 1881.

DIAGNOSIS of ATAXIA BY OCULAR SYMPTOMS.—Given certain visual troubles, such as feebleness, binocular diplopia, paralysis of one or more muscles of the eye, etc., is it possible to diagnose in advance that the patient will become ataxic? That is the question which Dr. SOUS (*Journ. de Méd. de Bordeaux*, 27 Juillet, 1881), endeavors to answer. He classifies the symptoms in two groups: 1. Those which are dependent upon an alteration of the optic nerve; and 2. Those produced by lesion of some other nerve.

Under the first heading, those which warrant a fear of ataxia, are the following: Gradual diminution of the acuteness of vision up to complete blindness, disproportionate to the evident ocular lesions. Further, the restriction of the field of vision commences at the outer borders, and progresses towards the centre. The pupil retains its form, but becomes grayish-white; there is also an alteration in the perception of colors, particularly for green and red.

As lesions of other nerves, the author mentions paralysis of the extrinsic muscles, especially those innervated by the third pair; sometimes there may be transient spasmodic contraction of these muscles. Strabismus is also mentioned, binocular diplopia, sometimes transient, sometimes permanent, and myosis, the pupil being fixed.—*Journ. de Méd. de Paris*, Dec. 31, 1881.

THE CONDITION OF THE UTERINE BLOOD-VESSELS AFTER PARTURITION.—Dr. BALIN has made a careful study of the changes in the uterine blood-vessels after delivery (*Archiv f. Gynaekologie*, Bd. xv., S. 157), and arrives at the following conclusions:

1. A part of the vessels of the uterine substance is obliterated by connective tissue; those remaining have their volume considerably reduced.

2. In the obliterated vessels, the tunica media is destroyed by fatty degeneration of its muscular fibres.

3. In the remaining vessels, the tunica media partially disappears.

4. The fatty degeneration of the walls of the blood-vessels commences later, and goes on more slowly, than the same process occurring in the muscular structure of the uterus.

5. A large number of capillary vessels of new formation are compressed by the uterine contractions which follow delivery, and are also absorbed or transformed by fatty degeneration.—*Journ. de Méd. de Paris*, Dec. 24, 1881.

PENETRATING PISTOL WOUND OF THE BRAIN.—In the *Boston Medical and Surgical Journal* for January 12, 1882, Dr. J. FOSTER BUSH reports the case of a boy aged sixteen, who was shot in the forehead one inch above the centre of the right eye, the ball, a number twenty-two conical projectile, entering the brain. After the accident he became comatose, the pupils dilated, the right not responding to light, the mouth drawn to the left, and the left arm and leg paralyzed for both motion and sensation. Seven months later perfect use of the arm and leg returned, the dizziness and headache disappeared, and, with the exception of some loss of memory, he appeared to be perfectly well.

DIAGNOSIS OF OVARIAN CYSTS FROM EXAMINATION OF THEIR CONTENTS.—Dr. GARRIGUES states that there is no element characteristic of myxoid ovarian fluid in the sense that a single hooklet is characteristic of a hydatid, but that by carefully weighing all the physical, chemical, and microscopical properties of the fluid, together with the other features of the case, a correct diagnosis is generally possible, while he knows of no character by which a cyst of the broad ligament can be distinguished from an ovarian cyst.—*Amer. Journ. of Obstetrics*, Jan., 1882.

RADICAL CURE OF HERNIA.—In a paper read by Dr. W. ALEXANDER at the meeting of the Liverpool Medical Institute, held December 1, he concludes:

1. That ligature of the neck of the sac, so as to obliterate the accidental or congenital depression, that was at once the predisposing and exciting cause of the hernia, offers by far the best methods of radical cure.

2. That other methods of cure are only effective in so far as they obliterate the sac up to its opening into the abdomen.

3. That methods of strengthening the abdominal supports too often fail if the sac is not obliterated, since the continuous pressure of the hernia on the unobliterated part of the sac will almost certainly neutralize and overcome any amount of cicatricial resistance that we are capable of generating in the surrounding tissues.

4. That after ligature of the neck of the sac, it is unnecessary to further disturb it except by incision to solve the continuity between it and the neck, and thus obtain better occlusion of the ligatured part.

5. That the operation, if carefully performed, is far less dangerous than the method of refusing to interfere with the cases upon whom the operation is justifiable.—*Liverpool Med. Chir. Journ.*, Jan., 1882.

ACTION UPON THE FŒTUS OF MEDICINES TAKEN BY THE MOTHER.—Dr. KUBASSOW (*Centralblatt f. Gynäkologie*) has employed the microphone to observe the condition of the fœtal heart, and thus to judge of the action upon it of drugs administered to the mother. He arrived at the following results: Chloral-hydrate and chloroform first excites and then stupefy, causing the fœtus to become quieter, and the heart-sounds duller and slower. They act in five or ten minutes, the action of chloral being more powerful than that of chloroform, and especially marked when given as an enema. Both of them can be detected chemically in blood from the umbilical cord. Chloral-hydrate depresses the temperature of the mother after two or three hours. Opium and its alkaloids caused distinct and persistent rhythm of the fœtal heart. They act more slowly than chloral and chloroform, and their action lasts longer. The opium acts more powerfully and quicker by the mouth than by enema. Its action probably depends on the morphia which it contains. Digitalis also acts powerfully and persistently. The author considers that the chloral-hydrate taken by the mother is divided between her body and that of the fœtus proportionately to the weight of each. This occurs in fifteen minutes, so that at the end of that time five per cent. of the chloral given to the mother has passed into the blood of the fœtus. The chloral-hydrate is not decomposed into chloroform. More than half a gram of chloral-hydrate in enema, either given at once, or repeated in less than half an hour, or more than fifteen minims of tincture of opium given at once, or repeated in less than an hour, are dangerous to the fœtus. Opium should not be given to pregnant women in doses exceeding a quarter of a grain.—*Practitioner*, Jan., 1882.

CONJUNCTIVAL TRANSPLANTATION.—M. MARC DUFOUR, in the *Revue Médicale de la Suisse Romande*, reports four cases in which he transplanted the conjunctival mucous membrane of the rabbit to the human eye. He operated in two cases of ocular symblepharon. The adhesion having been dissected away, a fragment of the mucous membrane of the rabbit's eye was applied to the denuded surface, and fixed in place by sutures. In an early case, that of an old woman, the operation failed; the fragment became necrosed, the woman being old. The fragments had been fixed with silk sutures. A little later the operation was performed on a child, aged eleven, and the transplanted fragment was fixed on the eye and the eyelid at the same time. The success was complete, and two months afterwards the fragment was quite living. In the case of a man, after the removal of an epithelioma of the eyelid, M. Dufour transplanted some mucous membrane taken from a small tumor on the lower lip of the patient himself. This operation was completely successful; nevertheless, it had to be followed a year afterwards by a fresh operation, the disease having recurred. This time, also, a fragment of the mucous membrane of the lip was taken. M. Dufour recommends that the transplantation should not be made too soon after the incision; that the fragment to be transplanted should be previously fixed with sutures to prevent the rolling up of the edges. He recommends that the revivified place and the fragment should be washed with salicylic acid.—*British Med. Journ.*, Jan. 14, 1882.

POLYPI AND EXCRESCENCES OF THE FEMALE GENERATIVE ORGANS.—According to the clinical and anatomico-pathological researches of M. FORGET, the urethral mucous membrane may exhibit three distinct conditions:

1. Papillary hyperplasia, which is very frequently observed, and which gives rise to granular vegetations, a number being usually conjoined, while the true polypus is generally single.

2. The true polypus, or fibrous neoplasm, is usually attached to the mucous membrane by a pedicle.

3. Simple hypertrophy of the mucous membrane by which a prolapse, resembling somewhat a polypus, is formed.

M. Forget also believes that whenever there is a permanent spasm of the urethra, the intense congestion resulting is a sufficient irritation to produce fungoid growths.—*L'Union Méd.*, Dec. 25, 1881.

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PROGRESS OF SANITARY ORGANIZATION.

THE progress of sanitary organization in the United States is one of the marvellous features of our civilization. Scarcely a quarter of a century has passed since the first ripple of agitation was set in motion by Jewell, of Philadelphia. At that period, 1856, the purposes of sanitary organization in civil administration were either unknown or altogether ignored. The first call for a National Sanitary Conference fell upon dull and credulous ears, and it was only as a Quarantine Convention that the movement gained popular favor. But from the moment that the first Convention began to discuss the great questions of quarantine, and allied subjects, May 13, 1857, sanitary reform took deep and abiding root in the public mind of this country. The second Convention was an enthusiastic gathering of officials and laymen, and sanitary questions naturally became the leading topics of discussion. Two more annual Conventions met, each being more and more largely attended, when the civil war absorbed for the time the interests which this great popular movement had created.

In 1865–6, the agitation was renewed by a fierce struggle between the medical profession of New York and the notoriously ignorant and corrupt political organization which controlled the health department of that city. The average intelligence of its officers appears in the answer of one of the health wardens to the official inquiry, "What is hygiene?" The prompt reply was, "The mist which rises from stagnant water." So wide-spread was this agitation that not only did all ranks of citizens of that city become profoundly interested in the result, but other cities, especially Chicago, Washington, and New Orleans, were stimulated to action, and entered upon similar crusades against their inefficient health organizations. In 1866, the contest in New York culminated in the passage of the Metropolitan Health Bill, the most perfect sanitary act ever placed upon the statute-book. This law has furnished the text for much of the subsequent sanitary legislation in this country. The Metropolitan Board of Health was confronted, immediately on its organization, with Asiatic cholera, but so successfully did it deal with the first outbreak of that pestilence that public apprehension was allayed, and the Health Department became the most popular branch of the city government, a position which it has steadily maintained for sixteen years. From this period the agitation for sanitary reform took a new departure, and spread to the most remote parts of the country.

In 1869, the State Board of Health of Massachusetts, after prolonged opposition, struggled into existence, and in the following year the State of California organized its State Board. In 1871, the States of Louisiana and Michigan established State Boards of Health, and in the following year the States of Minnesota and Virginia followed their example. The year 1872 is memorable for the organization of the American Public Health Association, a body which at first consisted of a few earnest laborers in different sanitary organizations, but which now comprises a membership of upwards of six hundred persons, embracing the leading thinkers and workers in the field of State medicine. This Association, meeting annually in conference upon the current questions in sanitary science and administration, has exerted a large and most salutary influence. To its annual discussions, so widely published, we must attribute much of that popularization of subjects relating to public hygiene so essential to the thorough organization of sanitary government, and its successful administration. It has stimulated new scientific inquiries, has sustained feeble and wavering health authorities, has aroused popular thought, and awakened an interest of communities in the insanitary conditions under which the people live. During the decade of its existence sanitary organizations multiplied with unexampled rapidity throughout the country, no less than twenty-two additional State Boards, making twenty-eight in all, being established during that period. The crowning event, however, was the organization of the National Board of Health, which gave completeness and perfection to the scheme of sanitary government in this country.

We have made this brief review of the progress of sanitary organization not so much for the purpose of congratulating the medical profession upon the brilliant future which evidently awaits State Medicine in the United States, as to encourage and stimulate

to greater endeavor. The present time is exceedingly favorable for popular agitation of public health questions, and for effort to secure sanitary legislation. Popular lectures on hygiene attract large and thoughtful audiences during the winter months, and do more to stimulate thought and action among the people than any form of printed matter. Every physician can give two or three lectures on sanitary subjects to the community in which he resides, which we know from experience will attract larger numbers than the lectures of popular speakers. Again, at this season State Legislatures are generally in session, and the occasion is favorable to obtain necessary legislation. Though twenty-eight States have organized State Boards of Health, yet the great States of Pennsylvania, Ohio, Missouri, Texas, and the old New England States Vermont and Maine lag in the race. With suitable effort on the part of our profession, there is no doubt that in every remaining State boards of health can be established during the coming year. When this most desirable consummation is reached, the United States will present an example of sanitary organization hitherto unrealized in modern civilization.

THE NEW YORK STATE MEDICAL SOCIETY, AND ITS NEW CODE OF ETHICS.

IN our last issue we published the new code of medical ethics adopted by the New York State Medical Society. We observe, with extreme regret, that this representative and influential organization has committed itself, in this act, to regulations in antagonism to the code of the American Medical Association, and has placed its membership in a position which we believe to be essentially false and illogical. Under the head of "Rules Governing Consultations," it is declared that "members of the State Society, and of the medical societies in affiliation therewith, may meet in consultation legally qualified practitioners of medicine," and that "emergencies may occur in which all restrictions should, in the judgment of the practitioner, yield to the demands of humanity." A "*legally qualified practitioner*" is one possessed of a diploma from some duly incorporated medical college, and he may "trade under any special designation," as homœopath, eclectic, physio-medical, or other term, which may be best for his interests. That there may be no possible misconception of the latitude thus allowed, "all restrictions" may yield, in the sole judgment of the physician concerned.

Trading under a special designation has, recently, been formally condemned by the Royal College of Physicians, of London—the purest conservator of professional dignity and morality in the whole medical professional body. The New York Society condemns with pragmatical particularity such offences as publishing handbills, private cards, and advertisements, the details of cases, and opinions on points of medical or surgical practice, inviting laymen to be present at operations, and the boasting of cures, and remedies, etc., and yet, in a line or two, opens the door to the most reprehensible of all practices, viz., consulting with practitioners who owe their success to the use of some special trade designation. Dr. Jacobi, the President, in his prelusive address, prepares the way for the revolutionary code of ethics, but without committing himself to it, by stating that if "the profession of the State of New York are sufficiently imbued with that spirit of logic and experimental science, we may overlook differences, and meet, with a spirit of reconciliation, those who do not encounter us any more with the dicta of a school or sect." The Code of Ethics does not assume even such a conservative position, but makes haste to surrender every principle for which the regular profession has heretofore contended. There has been on the part of regular physicians no spirit of proscription against those irregulars who would abjure their special creed and trade designation, and rank themselves as physicians only. The warfare has been, not against the consciences of men, not against the right to treat diseases according to their convictions of the utility of therapeutical measures. It is the parading of a special designation, the offensive proclamation of "*similia similibus*," as the trade insignia, against which the great body of the medical profession has protested, and will continue to protest. All the glittering generalities which are now uttered to conceal the real point at issue, the authority of great names, and the momentary outburst of a humanitarian sentiment in a great medical society, will not blind the thinking men of the profession.

To yield the point, of the right to consult with all kinds of irregulars who happen to be "legally qualified practitioners," is to admit that the regular medical profession has hitherto occupied a false position.

To yield the point, is to admit that they who have maintained the truth of an exclusive dogma, and have practised on a trade designation, were right, and those who opposed them were wrong.

To yield the point, is to strengthen all irregular practitioners in their position of bigoted intolerance, and to confuse and dismay the disciples and friends of legitimate medicine.

We do not believe that the medical profession will thus stultify themselves, but that they will more energetically than before reaffirm the great principles for which they have steadfastly contended.

In some future issue we will set forth more specifically why legitimate medicine *cannot* consort with those who trade under special designations.

FORCED ALIMENTATION IN CONSUMPTION.

THE attention of our readers has been drawn to the method of forced feeding of consumptives. The loud acclamations with which the new expedient has been received have hardly died away when some accidents are reported. M. Desnos, whilst admitting the good which may be thus effected, reports a case in which bad results followed. The patient had tubercular excavations in both lungs. After the milk was deposited in the stomach by the tube, a violent attack of dyspnœa occurred, and the patient expectorated milk. Pneumonia came on, and death ensued in thirty-six hours. At the autopsy, the lesions of tuberculosis and of a recent pneumonia were found, and the milk filled the trachea up to the larynx. Also, M. Bariot, *interne*, of Charité, has published three cases of absolute intolerance of the method. In some cases diarrhœa results. Nevertheless, M. Desnos continues to advocate the method, advising certain precautions. The liquid (food) should not be given during the febrile exacerbations, and should be introduced slowly.

M. Ferrand reports a case of hereditary phthisis advanced to the third degree, in which forced alimentation produced a marked improvement from May to July; but then the patient retrograded, notwithstanding the method was persisted in, and died in November.

Further clinical experience is necessary before deciding on the value of the new expedient.

A BUREAU FOR NURSES.

FEW people who have not tried it, know the difficulty and delay experienced in procuring a nurse. Sickness and accident always come unexpectedly, and the nurse is wanted instantly. How is one obtained? The ordinary process is to get a list from the doctor, and then make, afoot, in car, or in carriage, a weary pilgrimage for an entire day, not seldom two, and sometimes three, before one can be had, and then we have to be satisfied with what we can get, rather than what we wish to get. The Woman's Hospital Training School, and the Nurses' Home, excellent as they are, can only furnish one of their own pupil nurses when she happens to be there, or occasionally a graduate. And yet, at the very moment when the patient is anxiously seeking a nurse, scores of good ones are waiting a chance to earn a living. What we need is something to bring together the two classes.

Boston has done some very good things, and in the nurse matter two years since took an important step in advance. The Medical Library Association appointed a committee to manage the affair, in conjunction with a committee of ladies interested in the various training schools, after this fashion: Their Assistant Librarian, who lives on the premises, is the Secretary, and keeps the Directory. A nurse who registers gives references to several physicians and families with whom he or she has nursed. If the replies to the inquiries which are made are satisfactory, the name and address are registered after the payment of a small fee, together with the qualifications, charges, what kind of nursing is preferred, whether he or she will nurse in contagious diseases, insanity, etc. This record is afterwards added to by inquiries of every doctor and family who obtain the nurse's services. A register is then kept of all engagements, whether made through the Directory or not, and the nurse is expected to keep the Secretary informed of every engagement taken, and again when it is terminated, in order to keep it perfect to date. Any one, then, going to the office, day or night, with or without such a list of nurses, can be accurately and instantly informed who are engaged and who disengaged, their qualifications, terms, etc.; or, if desired, by letter or telegram, the Secretary himself will secure and send a nurse as quickly as possible. Wet nurses, in many cases certified as to good health, nurses for the insane, etc., can also be had. It is evident that as the advantages of the system become known, the increasing patronage, both of nurses and patients, will be mutually advantageous, in adding to the number, and especially in bettering the quality of the nurses, and the more competent nurses will obtain more frequent employment.

Financially, also, it has proved a decided success, even from the start, inuring thus to the advantage of the Library. In Boston 412 nurses, of whom 46 are men, are now on the register, and the monthly average of nurses furnished last year was 74. Many of them were obtained by telegraph all over the New England States, and sometimes even from greater distances. One instance of premature confinement, when the pre-engaged nurse was unable to come, shows well how quickly the want may be supplied. Within an hour after the telegram was sent, a nurse had been found, made her preparations, and was at the patient's door, five miles out of the city.

We are glad to learn that the College of Physicians of Philadelphia lately has appointed a committee to consider the feasibility of establishing a similar Bureau in this city, and we hope most earnestly that it will be established, and that the profession will give it a unanimous and hearty support, both by advising their nurses to register, and in turn by sending patients to the Bureau to secure such nurses. The College having already a local habitation, is pre-eminently the body to establish such a system, and with a generous support from the members of the County and other Medical Societies and the public, it will become here, as it has in Boston,

one of the most useful and most successful advances that has been made.

CONDITIONS UNDER WHICH OXYGEN IS A POISON.

PURE oxygen inhaled for three days determines, in mice, fatal congestive and inflammatory pulmonary lesions. If the animals are removed before the expiration of three days, the pulmonary accidents are not necessarily fatal, and their intensity is more or less related to the duration of the oxygen inhalation, in dogs as well as in mice.

Injected into the veins, pure oxygen proves fatal to dogs whenever the tension of the injected gas, irrespective of its quantity, is equal to the muscular strength of the right heart. Injected into the arteries in the smallest proportion, oxygen gives rise to serious nervous symptoms, often fatal, dependent on gaseous embolisms. The lesions vary from a simple ischæmia, up to hæmorrhages and acute softening, indicating an obstruction of the capillaries by elastic, gaseous columns. Breathed in a state of high tension, pure oxygen is a poison, as has been established by the remarkable researches of Paul Bert, confirmed by the experiences of M. Feltz. Under all circumstances, the action of oxygen is exerted on the nervous system.

Notwithstanding that oxygen may, under some circumstances, prove a poison, it is, under many others, a most useful remedy. In the asphyxia produced by the inhalation of cesspool gases, it affords prompt relief, by renewing again the function of the red globules. In many kinds of dyspnœa, it is the most rational remedy. When the respiratory organs are unable to obtain a sufficient supply of air, although exerting their utmost efforts, the inhalation of oxygen at once relieves the distress. Quebracho is supposed to blunt the sense of want of air, but oxygen relieves it by furnishing the required material. Quebracho, then, merely renders the patient insensible to the source of distress, whilst oxygen removes the cause of it. For many cases of dyspnœa, oxygen is superior to its newest rival. Oxygen, again, has an important office in improving the condition of the blood in anæmia, chlorosis, and allied conditions.

THE CARTWRIGHT LECTURES.

IN our present issue we complete the publication of the admirable lectures of Dr. Dalton "On the Experimental Method in Medical Science." We congratulate our readers that they are able to find in THE MEDICAL NEWS, on the week of their delivery, these important contributions to the history of physiology. In all that concerns the historical development of physiology, Dr. Dalton is, of course, a master. It is most timely to have brought before the profession the history of the remarkable extension which the experimental method has given to physiological science. Now, when ignorant enthusiasts are trying to destroy the most important means for contributing to the growth of this science, should be marshalled in order the vast array of facts and principles which but for the experimental method had remained unknown. It is, also, but just to the great experimentalists of the past, that we recall their achievements, and apportion the merit as it is deserved. In the ever-enlarging annals of discovery, the exact share of each worker in the results attained is apt to be overlooked or forgotten, and thus it often happens that supposed discoveries are but revivals of former achievements. We owe, then, our thanks to Dr. Dalton for the historical data of physiology which he is placing so lucidly and completely before us. And we have again to congratulate the Alumni Association of the College of Physicians on the bequest of Mr. Cartwright, which is enabling them, annually, to have delivered a course of lectures which, we may hope, will equal those which have for so many years contributed so much to the renown of English medicine—the Gulstonian, Lumleian, and other lecture courses. It is to be hoped that the example of Mr. Cartwright will be followed by other wealthy men, who may thus perpetuate their names in connection with a worthy and useful purpose. The Cartwright lectures were inaugurated last year by Dr. Bartholow, of Philadelphia, who gave a course of six lectures on "The Physiological Antagonism of Medicines and between Remedies and Diseases."

THE DOCTOR HIS OWN PHOTOGRAPHER.

MEDICAL men very frequently want photographs in cases of injury, deformity, tumors, etc., but the trouble and expense have been serious bars to obtaining them; and many patients, too, cannot go to the photographer. Drawings are often even more expensive, and always labor under the disadvantage of possible inexactness. Recently, however, the introduction of the "dry-plate" process has so simplified the method, avoided the former dangers, and reduced the expense, that any one of ordinary intelligence and means can now take all the photographs he wants at a moment's notice. At the Cincinnati meeting of the American Association for the Advancement of Science last August, Mr. Walker, of Rochester, New York, showed a "pocket camera," which, according to Prof. Lattimore, supplies every want of the inexperienced amateur. Its weight is only two pounds. "Dry-plate outfits" are now to be had at a cost of $10 and upwards, which are excellent. Provided with one of these instruments, the doctor would always be prepared to photograph any case he desires, at his office or in the sick-room. Our hospitals, especially, should be provided with

such a good outfit, so that cases and specimens could be photographed at any time, even by a resident. Our microscopists would also find it exceedingly useful to make permanent many a transient preparation not suitable for preservation.

NOTE ON NERVE-STRETCHING.

DR. G. LUDWIG writes to the *Lancet* of January 7, detailing a new method of nerve-stretching without the knife, or subcutaneous nerve-stretching, which, in the hands of Nussbaum and Billroth, seems to have given good results. It consists in narcotizing the patient, and then forcibly flexing the femur against the abdomen, so as to stretch the sciatic nerve round the neck of the femur. The method is well worth a trial, and may be, perhaps, of great value, but we must point out one error which may easily be committed in adults. If the femur be flexed up to about 40° or 45°, with the lower leg in extension, all is well, but at that point the hamstrings are put in complete tension, and beyond it they must be over-stretched and ruptured to a greater or less extent, while the narcotized patient cannot feel the pain, and so warn us that in stretching the nerve we are damaging the muscles. By flexing the leg we relax the hamstrings, and avoid the danger. How much this may relax the nerve, too, and so vitiate the nerve-stretching, is a question.

REVIEWS.

RHEUMATISM; ITS NATURE, ITS PATHOLOGY, AND ITS SUCCESSFUL TREATMENT. By T. J. MACLAGAN, M.D. 8vo, pp. 333. London: Pickering & Co., 1881.

Since March, 1876, Dr. Maclagan has been known as the prophet of the salicin treatment of rheumatism. Before his earliest publication appeared, Stricker announced that salicylic acid had been used by himself and others in Germany with great success (*Berliner klin. Wochen.*, Nos. 1 and 2, 1876). Maclagan has continued to maintain the superiority of salicin, and has invented a theory of rheumatism to account for the success of his remedy. The book now before us is the result of this conflict. It treats of the natural history of rheumatism, of the nature of the rheumatic poison, of the lactic-acid theory, of the miasmatic theory, of the nature and action of malaria, and of the various plans of treating rheumatism. The special motive of the book is to show the relationship between rheumatic fever and intermittent fever, and to refer the origin of both to *malaria*.

In his discussion of the various theories of rheumatism, our author begins with the lactic-acid theory. He finds that there is in this disease a great increase in the formation of lactic acid, and also in its elimination; but he "rejects its claim to afford an adequate explanation of the phenomena of rheumatic fever." He believes, nevertheless, that the presence of lactic acid is a necessary element in the morbid complexus, but a result rather than a cause. There is, he admits, no other product of tissue metamorphosis to which the rheumatic symptoms can be ascribed; he therefore seeks to find the morbific cause, the pathogenetic material, without the body. He finds this in malaria. There is a remarkable correspondence in the phenomena of a rheumatic and of an intermittent fever attack, according to our author. He holds to the miasmatic origin of rheumatism, and to the identity of the malarial and rheumatic poisons. The outcome of his reflections on the appropriate treatment of the rheumatic miasm was salicin. Observe his ratiocination: "A low-lying, damp locality, with a cold rather than warm climate, are the conditions under which rheumatism is most likely to arise. On reflection, it seemed to me that those plants whose haunts best corresponded to this description, were those belonging to the natural order salicaceæ—the various forms of willow. Among the salicaceæ, therefore, I determined to search for a remedy for rheumatism." Could any premises and conclusions be stuffed fuller of fallacies? He did not find his best antimiasmatic remedy in quinine, which had been fully tried, but in salicin, whose derivative, salicylic acid, had already become well known as a most efficient remedy for rheumatism. Nothing is easier than to prophecy after the fact.

Dr. Maclagan believes that the "whole of the salicyl series is possessed of antirheumatic properties," but that "salicin and salicylic acids are the two which are at once the most easily obtained, and the most convenient for administration." The largest possible doses are necessary, for "the rheumatic poison is a minute organism, which is propagated in, and acts on, the fibrous tissues of the motor apparatus of the body," and "the salicyl compounds act by destroying this poison, but for its destruction a certain quantity is necessary." He concludes that salicin is preferable because it is safer in the considerable quantity necessary. He apparently ignores the important fact that salicin, in its passage through the body, is converted into salicylic acid.

The salicyl compounds, our author thinks, "cannot fail to prevent cardiac complications *if given in sufficient quantity to destroy the rheumatic poison before this has begun to affect the heart.*"

With some fact there is much theory of a very unsubstantial kind mixed up in this book. Nevertheless, it contains much suggestive matter, is very readable, and is an attempt to set forth novel views divorced from the errors which have prevailed for several generations.

> "'Tis neither antiquity nor author
> That makes truth truth, although time's daughter."

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

Stated Meeting, February 2, 1882.

FORDYCE BARKER, M.D., PRESIDENT, IN THE CHAIR.

The Society was called to order at 8 P.M. After the reading of the minutes of the preceding meeting, Dr. JOHN G. ADAMS, Corresponding Secretary, announced the death of the following foreign, distinguished medical gentlemen:

THEO. SCHWANN, of the University of Louvain, Belgium, who was the discoverer of the primordial cells in animals and plants, and a distinguished microscopist.

M. BRIERRE DE BOISMONT, distinguished as a writer on medical jurisprudence. Died in Paris at the age of eighty-one years.

SIR ROBERT CHRISTISON, author of a treatise on poisons, and Professor of Medical Jurisprudence in the University of Edinburgh.

Dr. BOUILLAUD, the last of the distinguished men who made the Paris School of Medicine so famous fifty years ago. Author of a work on diseases of the heart.

Died the latter part of October, 1881, at the age of eighty-three years.

The PRESIDENT then made an introductory address as follows:

One of the avowed objects of this Academy, as expressed in its constitution, is the promotion of the public health. Strictly speaking, all of our scientific work is in this direction, but this meeting is, in a larger sense, devoted specifically to this object.

There is not a physician in this city, engaged in active practice, who is not frequently called upon to see disease of various degrees of severity, often resulting in death, which has been caused by a poison. If we can see our patients early enough, we can successfully meet such poisons as arsenic, as corrosive sublimate, as aconite, and all of this class, because we have antidotes which will prevent their effects. But where the poison is introduced into the system so insidiously that the subject is unconscious of its absorption until its effects are produced, then it is not a question of antidotes, but the problem is, how shall we counteract its consequences, and how shall we keep our patients alive until the life-destroying agents have ceased to put in jeopardy the vital powers?

The special poisons to which I now refer, are the gases resulting from defective plumbing, to which all classes—the poor occupants of tenement houses, those who are able to command the necessaries and many of the luxuries of life, and those who live in the most expensive houses, and whose riches can buy everything but health—are alike exposed. None but physicians can know how general this poison is, and how positively it explains much of the disease that they are called upon to treat, and of the many sad deaths which follow.

When I assert that it is a daily experience with me to see persons whose general health is suffering from this poison, as is manifested by malaise, loss of appetite and strength, slight febrile symptoms, diarrhœa, physical and mental depression; and that I have seen infants, children, and adults suffering from diphtheria, scarlet fever of a mild type complicated with this disease, and destroying life; those in vigorous health, students in colleges, ambitious and active young men in the professions or in the commercial or financial world stricken down by typhoid fever, some struggling through the disease, and others dying, and that the cause has been demonstrated to be this poison, I only state facts which are common in the experience of all physicians in this city. In some cases this has been the result of ignorance of the very sanitary conditions which environed them. For example, two young men were stricken with typhoid fever, one of whom died. They were not acquaintances, but occupied offices in the same building in the vicinity of Wall Street. On investigation, it was found that there was not a trap in the whole building.

In a house, in which but a few months before several hundred dollars had been expended to put the plumbing in perfect condition, a young man died of typhoid fever, others of the family became ill, when it was found that a defective waste-pipe was saturating the house with poisonous gas. But such facts as these are so common and so well known to the profession, that I need not dwell upon them.

It is the custom of many in this city, whose means will permit them to do so, to take their families for health and pleasure to various summer resorts, at the seaside, the mountains, and other attractive country hotels, but every year, for some time past, some of these places have proved fatal to health, and often to life, by typhoid fever, so that now it seems to be the plain duty of every physician to warn such families as hold him responsible for their health, of the danger of every such resort that does not give them the evidence of a competent sanitary expert that their house is safe from all such dangers.

None but physicians are alive to the fact that many of those now living in beautiful and expensive houses in this city are like the inhabitants who dwell at the base of Mount Vesuvius, in a soft, balmy, voluptuous atmosphere, surrounded by vineyards and gardens luxuriant with the olive, and the fig, and the orange trees, which mask and hide the danger and desolation of the lava and ashes. It is absurd to suppose that those who find pleasure in expending many thousands in buying, and art to embellish their home, will not gladly expend the insignificant sum necessary to make their homes healthy for their families and themselves.

The physician should never be an alarmist; he never can hoist the signal of danger, except when he sees the forewarning signs of an impending storm. Unfortunately, he never can see the danger from this poison until its effects are already beginning to develop, as shown by the disease. Then, again, he labors under the difficulty of being unable to demonstrate, or even suggest, where the poison originates. He can only say that science has established the fact that certain symptoms are due to certain causes. It seems to me that it is the duty of the profession to educate itself up to the point of being able to demonstrate intelligently to patients how the danger from these poisons may originate.

The PRESIDENT then introduced Mr. CHARLES F. WINGATE, who proceeded to read the paper of the evening, entitled:

Practical Points in Plumbing—Knowledge Necessary for Physicians for the Protection of their Patients.

He said that it seems like carrying coals to Newcastle to offer advice to medical men regarding sanitation. Yet, as the old derisive proverb has been set at naught by "the whirligig of time," so it has strangely come to pass that the sanitary engineer can now assume to instruct his betters, and even show physicians their omissions in matters properly within their province.

He, therefore, limited his remarks to the practical points relating to plumbing, and kindred subjects which have a direct relation to the physician's efforts to overcome disease. When so much sickness can be traced to unsanitary conditions due in the main to preventable causes, it is desirable that the family physician should be able to point out such conditions, and in a general way suggest the proper remedies for them. When, also, so much foolish fear prevails regarding the risks to health from so-called modern improvements, the physician should be able not only to assure, but to convince his patients, that plumbing properly executed with good materials, and upon scientific principles, is absolutely safe, and is decidedly to be approved rather than abolished. Plumbing appliances are hence no more deserving to be done away with than are gas or electricity, the railway or the newspaper, each of which is also open to serious objections. Whenever sickness, such as is usually traceable to defective plumbing or drainage, prevails in a house, and no sufficient cause for its existence is apparent, the physician should not be content until an examination has been made by a health officer, or other competent person, to make sure that the house is free from sanitary defects. Nothing should be taken for granted in such matters, and no evidence accepted regarding the safety of hidden plumbing work, as underground drains, cesspools, traps, etc., except to have them open to view, and their real condition proved beyond a doubt. Every physician should warn his patients not to lease or buy any dwelling, whether old or new, without having the premises thoroughly examined, and obtaining a certificate of their healthfulness; not the ordinary landlord's or agent's verbal statement that everything is lovely, etc., but a legal document that will hold good in the courts,

and be a ground for obtaining damages in case the house should prove to be unsanitary, and sickness result in consequence. This wise precaution is now being taken by many persons. The examination, however, must be thorough, or it will be useless, as a false sense of security, based upon an incomplete examination, is worse than absolute ignorance.

The first point is how to examine a house. In this examination, nothing should be taken for granted. Every part of the plumbing must be exposed to view, or tested. The peppermint test is one of the best for detecting defective plumbing. An ounce of peppermint in a pail of water is poured into the openings of the plumbing fixtures at the upper part of the house. If the smell of peppermint escapes by a leak, this shows that sewer-gas would also escape. A second point is the quality of the details of the plumbing work. A single portion of the work, one joint of pipe, will tell a practised plumber the capacity of the workman. If a house is deficient in its minor details, it will be found generally bad. A direct leak from a pipe will be shown by holding a candle near it. The practised nose can tell a leak in a short time, and by the density of the smell from a roof-pipe, it can be learned whether there is a trap in the pipe to the sewer. The sanitary engineer goes first to the cellar and looks at the sources of damp. These are manifold both in the city and country; rain and snow blow in; there is leakage from the water-pipes and areas, and there is the refrigerator waste.

Another source of danger is from broken or leaky underground drains. Most houses have underground drains which are made of tiles laid by ignorant workmen, and he had seldom or never found a drain which was not in a defective condition. In Boston he had found many drain-pipes without the proper pitch or flush. Some pitched towards the houses instead of the sewers; others were choked with grease, or there were no sewer connections at all. The plumber sometimes ran the drain over a rock, up and down, or ended it on one side, continuing on the other, or connecting two sections of six-inch pipe by a four-inch pipe. A break or stoppage meant a deadly deposit of sewerage. An important question arose as to the legal responsibility of owners for damages from sickness. The courts had lately decided, that if the landlord is cognizant of sanitary defects, he is liable for resulting injuries. Nothing but iron pipes with lead joints properly coupled, and carried along the cellars in sight, or in trenches easily accessible, should be used.

Another source of danger was from the enormous quantity of made land in cities. The New York Board of Health states that ten years are necessary to thoroughly purify made land.

Down to a very late date, many of the sewers of New York were constructed of inferior material and imperfectly laid. Badly-burned bricks, bogus cement, and sand that was half loam, were used in making them, while many times the contractors who laid them executed their work in the cheapest and most culpable manner. Few of the best sewers were really tight, while the majority leaked at every joint, and thus the whole system was an enormous source of soil pollution. From the lack of a comprehensive plan in the beginning, and of competent supervision during their construction, many of the sewers had little, or not enough, grade, and were not easily flushed. Hence, they become (especially when tide-locked) elongated cesspools and mere gasometers for creating evil. Their lack of ventilation leaves small chance for the sewer-gases to find vent, excepting through the house-drains, and the average plumbing affords no barrier against their free diffusion throughout living- and sleeping-rooms. And here it should be remarked, that sewer-gas is created not only in the sewers alone, but every inch of waste-pipe in a house, even though used to convey nothing but soapy water, or the waste of melted ice from a refrigerator, can and commonly does produce foul gases. The worst odors are from just such sources, and they are certainly unwholesome. There are many broken gas-mains. The soil can hardly be dug up without encountering the smell of gas. The gas companies are aware of this loss, and make it up in their bills. Prof. Chandler says that ninety per cent. of the cellars in New York are bad, and the speaker would say that ninety-five per cent. are either originally dangerous or made so by neglect.

There were several sources of foul air in houses. The air supplied to the furnace is often taken from the cellar, or the cold air-boxes are made of unseasoned wood, and in them rats, cats, and chickens seek shelter. In one house two chickens and a cat were found roasted in the brick work near the furnace. The refrigerator should have no connection with the drains as they are built in most houses, nor should the refrigerator waste run into the soil. Garbage and dust from wet and coal in cellars cause foul air, which is drawn up into the living-rooms by the suction of hot air, if not through the dumb-waiters. It is desirable to have the kitchen and laundry separate from the house. The servants' accommodations should be carefully looked to; for if they have poor rooms and no bathing accommodations, they are naturally careless in their household duties. Servants should not sleep on the ground floor, especially near closets. Hard floors are an improvement; but there is too much upholstery in houses, and there should be fewer curtains, which retain the dust. The plumbing ought to be isolated as far as possible, and the New York Board of Health recommends a shaft for the purpose, running through the house. It is bad to have inside bath-rooms opening into sleeping-rooms. There must be an ample water supply, and he was glad that Ericsson's caloric engine is being used to pump water. There was special danger in sleeping in rooms opening into closets. Most soil-pipes were too large, and hence only partially filled by water. Dangers from sewer-gas are largely due to job-building, the employment of poor, cheap plumbers, and the ignorance of architects.

Prof. DOREMUS said that at the request of the President he had the honor to perform a few experiments, which would demonstrate how readily gas passes through porous media. He had been instructed in this by that distinguished man, the late Prof. John W. Draper, about forty years ago. In 1867, at his last interview with Prof. Liebig, that gentleman had said to him, "Don't leave Munich without visiting Voit and Pettenkofer's laboratory," and he saw there what he proceeded to demonstrate.

On the table was a block of brown sandstone, twelve by fifteen inches long, and four and three-fourths in thickness. On each side of this, a depression, a quarter of an inch in depth, had been made. Iron plates had been inserted in them, and attached by clamps. To each iron plate an iron tube was fixed. The whole surface of the stone, except that covered by the iron, had been coated with many layers of varnish. Prof. Doremus, by means of a flexible tube, connected the gas-pipe with the iron tube attached to the iron plate upon one side of the stone. After waiting a minute or two, he applied a lighted taper to the end of the other tube connecting with the sandstone on the other side, and a small flame sprang up, showing that the gas had passed through the solid stone. Prof. Doremus then took a block of brick-work, eight inches in thickness, made of Philadelphia brick, with plates and tubes attached in the same manner as to the sandstone. By blowing through one of the tubes, a candle-light, placed

at the end of the other, was deflected; and this deflection lasted for some time after the blowing had ceased, showing that it took some time for the air to go through the brick. Blowing still harder, the light was extinguished. Prof. Doremus added, that hydrogen or street-gas could be passed through stone in the same way, and that the pressure necessary to accomplish it was very small.

The next experiment was for the purpose of demonstrating the permeability of porous substances by gas, and the fourth experiment illustrated the fact that gas will pass through porous substances, notwithstanding it is opposed by the pressure of a whole atmosphere. What had been proven to be true of the gases used in the above experiments was true of sewer-gas and illuminating-gas. What steps, then, must be taken to protect ourselves from their evil influence? Water traps were inefficacious, for the gases would pass through the water and out into our houses. The only way was to kneel at the shrine of chemistry, and to make use of such substances as would decompose these poisonous gases. At Bellevue Hospital permanganate of potassium had been used for this purpose; Labarraque's solution, or the chloride of zinc, could also be used. Exposing the water and gas in our sewers to such agents destroyed all poisonous germs. Every emanation from our bodies, with few exceptions, is a compound of hydrogen, and there is not one of them that cannot be destroyed by chlorine, bromine, or some such substance.

Suppose a case of scarlet fever occurring and resulting in the impregnation of the walls of the house with the poison. Bromine or chlorine, both of which readily volatilize, may be used to destroy the poisonous germs. In 1865, the ship "Atlanta" arrived in New York with a number of cholera patients on board. Sixty of her passengers had already died. The "Atlanta" and all other vessels entering the Narrows were treated with chlorine, bromine, and other similar agents, and with the result of stamping out the disease entirely.

Dr. Agnew had informed the speaker that about thirty years ago the north wing of the old New York Hospital became so foul from the reception of a large number of ship-fever patients as to be unfit for use. Ventilation was tried, but in vain. Three workmen, engaged in scraping the walls, sickened and died. At the Lincoln County Hospital, England, the walls became magazines of disease in the same way. They were gutted and replastered, but doing no good, they were torn down to the very foundation. Some years ago certain surgical wards in Bellevue Hospital became so infected that many patients died of pyæmia. At the request of the Commissioners of Charity and Correction, Prof. Doremus attempted to purify them by the use of chlorine gas. The enormous amount of three tons of this gas was generated in these wards, and though many weeks were necessary for its accomplishment, the result was very satisfactory. Dr. James R. Wood had stated that since then no cases of pyæmia had occurred. Every few months now the chlorine treatment, though in a less rigorous form, is resorted to. He thought he was warranted in saying that, owing to the porous character of all walls and the decomposing power of certain gases, we can purify the most stately edifice if we would adopt the heroic chemical treatment.

Prof. Doremus said he spoke upon this occasion with a good deal of feeling and earnestness. On the first of last December he was to have delivered a lecture, illustrated by experiments, in which his son, fourteen years old, was to have assisted. The day before that son died from the evil effects of sewer-gas. Another son was just now recovering from the effects of an illness due to the same cause. He would have rather given his son the deadliest poison in his laboratory, and have trusted to the antidotes, than to have had him inhale this sewer-gas, for the deadly effects of which we have no remedy.

Dr. WILLARD PARKER said we had all known, he thought, of the fearful destruction of life in the wards of certain hospitals after they had become old and the walls saturated with disease. We had supposed fumigation and white-washing would remove the cause of disease, but had now been informed that this kind of treatment was of little or no avail. He would never forget the condition of things in Bellevue Hospital in 1846, when its wards contained so many patients with ship fever. He had never seen any disease which he really dreaded except ship fever. At the time referred to the wards were filled to their utmost, and Dr. Riess was house physician. Going through the wards in the morning they would pick up a dozen or more that had died during the night. It was supposed that the patients were crowded too much. Beds were laid upon the floor, but the death-rate continued very large. The subject then came up before the Medical Board, and it was decided that, as no more patients could be accommodated in the wards of the hospital, tents should be erected in the yard under the trees. The result was that nearly all the patients placed in tents recovered.

Many of those present may remember the vessel "Phœbe," which was driven upon the shore at Perth Amboy in 1847. Many patients with typhus fever were on board. A large number of deaths had already occurred; but when the ship went ashore and the patients were taken out and placed upon the ground, under the trees, and in hastily improvised canvas tents, or stalls, not one of the eighty-four thus placed died. These instances only showed the great importance of having the right kind of air to breathe.

Previous to the introduction of Croton water into New York in 1846, he did not remember of having seen a case of diphtheria. We had cases of croup, or membranous croup, as it was then called. Occasionally we met with a case of sore throat which was diphtheritic in character, the tonsils being enlarged and covered with a little whitish membrane. Diphtheria was the result of sewer malaria. There were none of us who had been in practice many years but could recall instances where the disease had occurred in families and swept away several members, and apparently without any cause. "Suppose, sir, Mr. President," the speaker asked, "there was a vault containing dead bodies near your house, would you be willing to have a tube connecting your bed-room with it?" Yet this is practically what we do with our sewers. I say, sir, that whenever diphtheria occurs there is something wrong with sewerage. Now, if I were going to build a house, I would not have it connected in any way with the sewer. I would have old-fashioned bowls and pitchers upon my washstands. Back of the house I would have constructed a sort of annex, where I should have all the sewers, closets, and all the pipes of the house. This matter demands our most earnest attention. New York, in this respect, is in a very critical and unhealthy condition, and the time has arrived for energetic action.

The PRESIDENT then referred to the presence of two physicians who had been members of the Board of Health, and said he would call upon them in the order of their seniority.

Dr. VANDERPOEL, one of the Honorary Fellows of the Academy, remarked that one thing was certain, the time had now come when physicians should know not only the principles of their profession, and two or three of the natural sciences, but they must know the elements of plumbing, and the sanitary construction of houses, so as to point out their defects, as it was impossible to trust mere mechanics. One defect not

pointed out in the paper of the evening is, that there is no soil drainage proper in New York. Though there are sewers connecting with every house, there is no chance for the moisture of the soil to escape. Phthisis has been shown here and in England to be induced by this character of the soil. In England the use of a proper system of drainage has reduced the disease. There is much filled soil here, and no provision has been made for the release of the water contained in it. While it was desirable to have soil-pipes exposed to view, it was practically impossible, as they would disfigure elegant dwellings, and in small houses space was too valuable. All joints of pipes should be carefully caulked with tow, lead, and sulphur. But when the pipe is set in a slit in the wall, the caulker could reach only half way round it, and the rest of the distance about the joint was untouched. The sanitary engineer was assuming an important place in the professions, and every house should be inspected.

Dr. JANEWAY said it was hard to distinguish between sickness from sewer-gas and sickness due to disease-germs entering sewer-pipes. Small-pox may come from germs in the sewer, but no one would attribute it to sewer-gas. Excluding diphtheria, he thought all would agree that contagious diseases did not arise from sewer-gas.

The portability of the germs of diphtheritic disease was much greater than was generally supposed. He knew of a case very recently where a child was taken sick with diphtheria in the country. Its clothes were brought home, and three members of the family sickened of diphtheria. We should correct the defects in our sewers, but we should not lose sight of a more important point, the portability of contagious germs. In his own practice it had occurred that diphtheritic germs were carried from Brooklyn to Florida in a trunk. Another point not to be lost sight of, is the possibility that much of the typhoid fever does not come from breathing sewer-gas, but from drinking water containing the germs of the disease, which have been drawn up into the water-pipes, and in that way get into the alimentary canal. In a case under his observation, several children were sick in a large house. He turned the water on below, and then turning it on above, the air was sucked into the pipes below. These faucets were over some drain-pipes connecting with closets, where diphtheritic stools had been deposited, and the water above, which was subsequently drunk, was thus tainted. This occurs also where there is no trap, or where there is no direct communication with the sewer. Dr. Janeway closed by explaining some tests with the chlorate of lithium.

Dr. PETERS was called upon by the Chair, and spoke of the large amount of sickness caused by foul docks. He recommended the carrying of sewer-pipes out to the end of docks.

The PRESIDENT then presented the prospectus of a plan for instructing the general public, policemen, firemen, etc., in the general principles of nursing.

Dr. AUSTIN FLINT, Sr., proposed resolutions approving the plan, which were adopted.

OBSTETRICAL SOCIETY OF PHILADELPHIA.

Stated Meeting, February 2, 1882.

E. L. DUER, M.D., PRESIDENT, IN THE CHAIR.

Sponge-Tents.—Dr. ALBERT H. SMITH said it is not necessary to dilate upon the necessity of mechanical dilators for the neck of the uterus, both as a means of diagnosis and as an important therapeutic measure. The original sponge-tents were made from a flat piece of sponge, saturated with wax, and pressed flat between pieces of marble. This form of tent is comparatively useless, as it expands in one direction only. The first suggestion of the present form was, I think, by Dr. Sims in his work on *Uterine Surgery*. His method consisted in immersing a conical piece of sponge in a strong mucilage of gum-arabic, impaling it upon a wire skewer, and winding it tightly with a cord, after which it was hung up to dry, when the cord and skewer were withdrawn, and the tent smoothed with sandpaper. If the cord was wound on the sponge with sufficient tightness to give the tent useful expanding power, great difficulty was experienced in withdrawing the stylet. I was led to make a few changes in the method, and now employ a cylindrical piece of sponge, which is saturated with water only, and, without any stylet, is wound with a piece of fishing-line, to which a six-pound weight is attached; this compresses it thoroughly, and its form is easily given by the fingers during the process of rolling. The surface should be made as smooth as possible by means of sandpaper. The tent should be of uniform size from end to end. If it is conical, the tent is introduced as far as possible, but only the small part, without much dilating power, enters the internal os, and it is not unfrequently withdrawn unexpanded, while the external os and the cavity of the cervix are widely dilated. The sponge selected should be strong and fine. I have seen tents made from coarse, rotten material, which would break during the extraction, leaving portions within the cavity of the uterus.

The introduction of medicating materials into an internal cavity of the tent is objectionable, as they usually corrode the sponge, and the space and loose winding necessary to allow the removal of the stylet reduce materially the dilating power. The curved shape is useless, as the uterus can be straightened before the insertion of the tent, and less force is needed for the insertion of a straight one.

To prepare the uterus for the introduction of a tent, first use a dilator of soft metal, or a graduated wax bougie, to straighten the cervix and measure the length and calibre of the uterine cavity, noting tortuosities, etc.; then rapidly introduce the largest tent possible, having first coated it with an enamelling material—as soap—and immersed it in a box of salicylic acid in fine powder, which is to be rubbed in thoroughly to form an antiseptic paste over the tent. A sponge-tent thus prepared may be allowed to remain in situ for forty-eight hours without developing any unpleasant odor, unless there is breaking-down tissue, which may overpower the disinfecting powers of the acid. For ease in inserting, I have had constructed a peculiar, powerful forceps to hold the tent, which is clamped tightly, and enables the operator to pass it rapidly to its position. Hot-water injections after the tent is in position will expand the sponge rapidly, and fix it in about a minute. If pain follows the insertion, it can be controlled by opium suppositories.

If the tent is removed at the end of twenty-four hours, it will cause hæmorrhage, because the spongioles have buried themselves into the cervical tissues, which grasp it tightly, and a forcible extraction will drag away portions of the uterine tissue, and leave a raw and absorbing surface. But at the end of forty-eight hours the tent comes away easily without any bleeding. The contractile power of the uterus still remains at the end of twenty-four hours, and the presence of a finger or application in the cavity of the uterus causes rapid contraction. At the end of forty-eight hours the uterus is paralyzed, all pain has ceased, and local irritability is less. When the tent is removed, wash out the cavity of the uterus with tepid, salicylated water, and, if necessary, introduce a second tent.

Among the advantages of the sponge-tent are its slowness of dilatation—not slowness of expansibility. The power of the laminaria-tent is greater as a dilator,

but it will slip from the uterus as soon as it has ceased expanding, while the sponge-tent will remain as long as it is wanted. The sponge has also a disintegrating power over morbid surfaces. The healthy tissue will contract again, but diseased structures will not contract, but will slough off, their vitality being destroyed. The sponge being porous, discharges will pass through it.

The usefulness of the sponge-tent is for both exploratory and therapeutic purposes. It causes less pain than the laminaria-tent, and after its removal there is less tendency to contraction, and it is, therefore, more satisfactory for exploratory preparation. The sponge has a stimulant effect on the uterine parenchyma, and in cases of chronic metritis and hyperplastic enlargement it will cause a reduction of bulk. In one case, after the prolonged use of internal applications of iodine, nitric acid, etc., the repeated use of sponge-tents resulted in a complete restoration of the uterus to the natural size. In cases of stenosis the laminaria-tent may be preferable, and I prefer it to cutting operations or the use of powerful steel dilators. In one case, years ago, I introduced a sponge-tent in my office, and allowed the woman to walk home, and keep about her daily duties. The menstrual flow came on two days later entirely without pain, for the first time in the patient's experience; the flow escaped through the sponge and the latter was then removed. Conception occurred before the next menstrual period. The sponge-tent is also the safest agent for the destruction of granular growths of the endometrium. A patient had been bleeding profusely at every period for three years; supposing a polypus to be the cause, a sponge-tent was introduced to secure dilatation; a finger was introduced into the uterus, but finding no polypus, more tents were passed to the fundus, and fungoid growths of the endometrium were broken up by the tents. I was disappointed in my expectations of finding and removing the supposed cause of the hæmorrhages, but was agreeably surprised to find the patient remain well after the uterus contracted. Another patient was sent to me from Boston, for diagnosis only. I obtained permission to use a tent for exploratory purposes. I dilated the uterus with the largest sponge-tent passed to the fundus, introduced my finger and found fungosities on the anterior wall, but the means intended for exploration resulted in a cure.

In a case of polypoid pedicellated growths, I at once dilated with sponge-tents after the use of the wax bougie. The finger found a pedicellated growth as large as a hen's egg, but the tent had disintegrated it, and it could be removed by the finger without instrumental aid.

(To be continued.)

CORRESPONDENCE.

ABORTIVE TREATMENT OF FELON WITH COPAL VARNISH.

To the Editor of THE MEDICAL NEWS:

THE MEDICAL NEWS of January 28 contains an article upon "The Abortive Treatment of Felon with Copal Varnish," by A. B. Isham, M.D., of Cincinnati, O., in which the writer attributes the abortive influence to turpentine and pressure. As confirmatory of the views there expressed, I will state that the negroes of the pineland region of South Carolina very commonly treat whitlows with the "dip" taken from the box in which the crude turpentine, or gum, is collected, containing the rosin and turpentine in a state of union. They are separated by "stilling," or distillation. The affected finger is smeared with the "dip" taken from the tree-box, and wrapped up closely in a piece of cotton or linen cloth. A domestic remedy, used by the whites, is to dip the finger threatened with felon in boiling turpentine, the turpentine boiling at a much lower temperature than water. Both of these methods are fairly successful, but neither are specifics. Another domestic remedy is dipping the finger in water as hot as can be borne. I suppose both of these hot applications are efficacious from the well-known astringent action upon the capillaries that hot fluids exercise. The writer, I presume, is familiar with the practice of applying lunar caustic over the skin of the affected finger, although he does not mention it. This will occasionally prove abortive. I presume all of these remedies, although widely different in character, act somewhat in the same way, abating inflammatory action by their constrictive action on the capillaries of the part.

Yours very truly,

BENJAMIN RHETT, M.D.

SUMMERVILLE, S. C., Feb. 1, 1882.

NEWS ITEMS.

BROOKLYN.

(From our Special Correspondent.)

AMONG the changes in the departments incident to the new *régime*, we note that Dr. Jas. Crane has been succeeded by Dr. Jos. H. Raymond as the Commissioner of Health.

Steps are being taken to organize a night medical service under a law passed in 1881. Five thousand dollars will be set aside for that purpose when the Board of Apportionment meets.

CANADA.

(From our Special Correspondent.)

CANADIAN VETERINARY COLLEGES.—The attendance at the Toronto and Montreal schools this season is large, over one hunded students at the former and about fifty at the latter. In both the majority of the students are Americans, even the most distant States, as Texas, sending representatives. The Montreal school is affiliated with the medical faculty of McGill University, and the pupils take botany, chemistry, and physiology with the medical students. The course extends over three years, six months' session, with matriculation, primary, and final examinations.

HOW TO GET RID OF A PROFESSOR.—The difficult question of how to get rid of an unpopular or inefficient professor was recently solved in a Nova Scotian college by the students "striking" in a body, and refusing to attend his lectures.

MEMORIAL TO DR. ROLPH.—It is proposed to erect a memorial to the memory of the Hon. Dr. Rolph, who for many years was a prominent medical man and politician in Ontario. He founded the Victoria Medical School in Toronto, better known as Rolph's School, which did not long survive his death, in 1869.

EFFECTS OF FEEDING A CALF WITH TÆNIA.—In connection with the course of lectures on helminthology at the Montreal Veterinary College, the interesting experiment was recently made of feeding a calf with ripe segments of tænia saguiata. The animal became ill, and when killed, seven weeks later, there was well-marked cestode tuberculosis, the muscles swarming with the larvæ or cysticerci.

HEALTH IN MICHIGAN.—For the week ending Feb. 4, 1882, the reports of the Michigan State Board of Health indicate that influenza, scarlet fever, and ton-

sillitis have considerably increased, and that rheumatism and pneumonia have considerably decreased in area of prevalence.

Reports have been received showing small-pox present during the week ending Feb. 4, and since, at thirteen places in Michigan, as follows: On a vessel at St. Joseph, Berrien Co. (1 case), Feb. 2; in Park Township, St. Joseph Co., Feb. 2; in Spalding, Menominee Co. (14 new cases), Feb. 3; in Elkland Township, Tuscola Co. (1 case), Feb. 3; at Kalamazoo, Grand Rapids, Saginaw City, Detroit (2 new cases), and Marshall (1 case), Feb. 4; in Port Huron Township (8 cases), Feb. 5; in White Cloud, Newaygo Co. (3 cases), near Menominee (1 case), Feb. 6; in Kimball Township, St. Clair Co. (4 cases), Feb. 7, 1882.

Other contagious diseases are reported at places too numerous to mention; scarlet fever at twelve places, diphtheria by twenty observers, at eighteen places.

FIRES IN THEATRES.—In the *Revue Scientifique*, January 7, 1882, there is an interesting historical and statistical review of the different disasters which have occurred in places of amusement from fire. At its conclusion, the author alludes to the experiments of M. Monnier, on the chemistry and physics of the gases produced in combustion, and gives the recommendations of M. Karl Vogt, based on these studies, as to the means by which suffocation can be best avoided under such circumstances. These are: 1. The replacing of the drop-curtain by a metallic screen, which will completely shut off the auditorium from the stage, and which must be capable of being placed in position with the greatest ease and despatch; and 2. The placing in the ceiling of the stage, and above the chandelier, of a large ventilator, which can be readily opened, and by which the deleterious gases, greatly expanded by the heat, may be allowed to escape, and access to the firemen thereby rendered safe.

The *Lancet*, January 7, in a short article on the "Anatomy of Panic," recommends that "the managers and chief performers should make it a point of honor to keep *their* self-possession, and preserve smiling faces above the footlights if any hitch occurs."

In addition to these, it would be well if the public were accustomed to the use of all the means of exit, and all exit doors should only be fastened on the inside, and by bolts which can be readily slipped. All passages to exit doors should be so labelled, and the law should require them to be kept unobstructed.

INTERNATIONAL HYGIENIC CONGRESS.—The fourth annual session of the International Hygienic Congress will be held at Geneva, Switzerland, from the 4th to the 9th of September, 1882. An exposition of publications, plans, designs, and objects of all characters relating to hygiene, will be held in Geneva from the 1st to the 30th of September.

SURGEON-GENERAL BARNES.—A press despatch from Washington states that Surgeon-General Barnes is not to be retired for the present, owing to the fact that a bill is pending in Congress to provide for his retirement with the advanced rank of Major-General, in recognition of his services in connection with the illness of President Garfield. It is eminently proper that such recognition should be made, and its fitness has already been urged in these columns.

THE ILLUSTRATED QUARTERLY OF MEDICINE AND SURGERY.—The prospectus of the new journal, whose début we announced a fortnight ago, is issued. Each number will consist of four quarto plates, with twenty-four pages of text. It will only contain original matter, and will be under the able editorial management of Drs. George Henry Fox and Frederic R. Sturgis, which should assure to it the success which we trust it may attain.

SMALL-POX.—The returns for the week ending February 11 show a mortality in New York of 21; in Philadelphia, of 15; Pittsburgh, of 27; Boston, of 1; Titusville, Pa., of 1; Cincinnati, of 25; Chicago, of 20.

PARIS FACULTY.—Prof. HAYEM has been transferred from the Chair of Therapeutics to that of Pathological Anatomy, vacant by the nomination of M. Charcot to the new Chair of Nervous Disease.

UNIVERSITY OF THE CITY OF NEW YORK.—Dr. Wm. C. Jarvis has been appointed Lecturer on Laryngology, vice Prof. J. Elsberg, M.D., resigned.

PERSONAL.—The busts of Dupuytren and Baron Larrey have just been placed in the gallery of the French Institute.

OBITUARY.

SIR ROBERT CHRISTISON, BART.

THIS illustrious physician and toxicologist died on the morning of the 27th of January, at his residence in Edinburgh. He attained the unusual age of eighty-five years, having been born in 1797. If we except the severe illness which led to his retirement from active life in 1877, and from which he afterwards almost completely recovered, he enjoyed comparatively good health until a month ago, when he was laid up with a severe catarrh, from which he never rallied. He was the son of Prof. Christison, who for some years occupied the Chair of Humanity in the University of Edinburgh.

He commenced his university studies in the year 1811, passing through both the arts and medical curriculum. Graduating after eight years, and having had the advantage of being for two and a half years resident physician at the Royal Infirmary in his native city, Dr. Christison proceeded to London and Paris. At the latter place he studied under M. Orfila, the celebrated toxicologist, and soon became a specialist in that department of medical science.

Shortly after his return to Edinburgh, and at the early age of twenty-five, he was appointed to succeed Alison as Professor of Medical Jurisprudence in his *Alma Mater*, in which position he remained for ten years. During this period he published his widely-known *Treatise on Poisons*, a toxicological work which for completeness, scientific accuracy, and philosophic spirit has never been equalled in any language. Although it is now more than fifty years since its first publication, it still remains the standard work on the poisons of which it treats.

On the death of Duncan, in 1832, Dr. Christison was transferred to the Chair of Materia Medica, which position he occupied until 1877, when failing health compelled him to resign, his successor being his former assistant, and the well-known pharmacologist, Dr. Thomas R. Fraser.

Prof. Christison's lectures formed for many years one of the chief attractions of the Edinburgh Medical School; and this is no meagre praise when it is remembered that among his colleagues were such world-famed surgeons and physicians as Syme, Simpson, and Gregory. His popularity as a lecturer continued to the end, and none were more venerated and loved by his pupils, who are now to be met with in every part of the globe, than Sir Robert Christison. Exact in his information, lucid in exposition, lively and almost playful in manner, occasionally illustrating his subject with an appropriate anecdote, most generous and sympa-

thetic in his relations to his students, his lectures were listened to with genuine pleasure and appreciation.

In his extra-academical life he was no less fortunate. He was for many years the most popular consulting physician in Scotland; and he was appointed physician in ordinary to the Queen for Scotland. His services as a toxicological expert were in much request throughout Britain, and in this capacity his name is associated with all the notable poisoning cases of the last half century.

Besides the *Treatise on Poisons*, to which we have already alluded, he wrote the article "Poison" for the seventh edition of the *Encyclopædia Britannica*, and the article "Orfila" for the eighth edition; not to speak of numerous papers, elsewhere published, on the toxicological effects of arsenic, opium, and other drugs. He has also rendered valuable service to the profession in connection with the last edition of the *Edinburgh Pharmacopœia*, merged, since 1864, like those of London and Dublin, in the *Pharmacopœia Britannica*, prepared under the auspices of the General Medical Council. In his *Dispensatory*, published in 1842, he presented a commentary on the then existing pharmacopœias, characterized, like his book on poisons, by precision in detail, and by the concise, yet happy, expression of suggestive generalizations. He has also contributed some valuable clinical and pathological memoirs. His work on the *Granular Degeneration of the Kidneys*, written in 1838, is still held in high estimation.

Another form of disease to which he devoted special attention was that of fever, in its numerous and perplexing varieties. In this case he was able to speak from personal experience, for, owing to a peculiarity of constitution, he was liable to suffer frequently from tolerably severe febrile attacks. He gave the results of a long clinical experience in a paper on the "Changes which have taken place in the constitution of Fevers and Inflammations in Edinburgh during the last forty years." He held that fever had changed from sthenic to an asthenic type, and that, whereas venesection was at one time servicable, it was now injurious. It was not a mere change in the manner of our therapeutics.

Dr. Christison also did much to improve and cheapen the dietary of Scotch prisons, and other public institutions, by his elaborate investigations in the effects on the health of the prisoners of various forms and combinations of food.

Throughout his long and brilliant career he received many public tokens of the esteem in which he was held by all. In 1866, the University of Oxford bestowed on him the highly honorary degree of D.C.L., and, in 1872, his own University made him, while yet a professor within its walls, an LL.D., an honor without precedent in its annals. He was twice elected President of the Royal College of Physicians of Edinburgh, and he was for some time President of the Edinburgh Royal Society. He was offered the Presidency of the British Medical Association in 1875, but he was obliged to decline the honor on account of infirm health. In 1871 he was made a baronet by the Queen, in recognition of his position as premier physician of Scotland. He was professor for the very long period of fifty-four years, a length of service unequalled in the records of the University since its foundation.

In 1872 the jubilee of his professorship was celebrated with great *éclat*. The University Volunteer Company, of which he was captain, presented him with a sword of honor; the Edinburgh University Club, of London, which is presided over by the Duke of Argyle, sent him a congratulatory address, and a banquet was given in his honor, at which were present many of the most eminent literary and scientific men in the kingdom.

In person he was tall and broadly, though not stately, built; even to the last he walked remarkably erect, and the litheness of his step often excited astonishment. Only a few months before his death he had ascended one of the highest of the Scottish hills, Ben Nevis, and this was no uncommon feat during the last decade of his life. The baronetcy falls to his eldest son, Alexander Christison, who is Deputy Surgeon-General of the Bengal army and Principal of the Agra Medical School.

NOTES AND QUERIES.

THE POTASH THEORY OF URÆMIA.

To the Editor of THE MEDICAL NEWS:

SIR: In glancing over your issue of January 7, I noticed a clipping from the *Bull. Gen. de Therap.*, of September 15, 1881, on a new theory of uræmia by MM. Feltz and Ritter, saying that a "certain quantity of the salts of potassium contained in the blood influenced in a certain degree the amount of urea necessary to produce grave or fatal results." I do not know whether I would have paid any special attention to the paragraph had it not been for the following circumstances: During the prevalence of scarlatina in our village I was over-solicitous for the welfare of my youngest daughter, a bright little thing of four years, she having at the time an *infantile eruption* of the lower extremities. I gave her three times a day chlo- and iodide of potash regularly, in order to relieve her of the sores, but more especially to charge her system with potash to lessen the severity of the attack of scarlet fever, as I supposed. Now she was the *only case in the village that died of uræmic poison*, and, in fact, the only one who succumbed to the disease in thirty or forty cases. I just give you this one instance; whether there was anything in it, or only a coincidence, I cannot say,

Very respectfully yours,

L. M. SENCINDIVER, M.D.

DARKESVILLE, W. V., January 25, 1882.

[Our correspondent's case is a striking clinical confirmation of the potash-salts theory of uræmia. Since the publication of Feltz and Ritter's experiments, Astaschewsky, of St. Petersburg, has announced that he had arrived at the same conclusion. He found no effect from the injection into the blood of urea, or creatinin, but the mineral constituents of the urine caused uræmia. When the potash salts were removed from them, no effect was produced. It seems to be established, therefore, that the retention of the potash salts is the cause of uræmia. The practical applications of this fact are obvious.—ED.]

OFFICIAL LIST OF CHANGES OF STATIONS AND DUTIES OF OFFICERS OF THE MEDICAL DEPARTMENT, U. S. ARMY, FROM FEBRUARY 7, TO FEBRUARY 13, 1882.

CAMPBELL, JOHN, *Lieutenant Colonel and Surgeon.*—Medical Director Department of the South. Granted leave of absence for fifteen days from 13th inst.—*S. O. 17, Department of the South, February 11, 1882.*

GARDNER, WM. H., *Captain and Assistant Surgeon.*—Assigned to duty as Post Surgeon at Fort Concho, Texas.—*S. O. 13, Department of Texas, February 6, 1882.*

TREMAINE, W. S., *Captain and Assistant Surgeon.*—Who reported at these headquarters January 9, 1882, per par. 12, S. O. C. S., A. G. O., will await further orders in New York City, from date of his so reporting.—*S. O. 20, Department of the East, February 7, 1882.*

BARTHOLF, JOHN H., *Captain and Assistant Surgeon.*—Fort Lapwai, Idaho. Granted leave of absence for fifteen days.—*S. O. 12, Department of the Columbia, January 25, 1882.*

WOOD, M. W., *Captain and Assistant Surgeon.*—The seven days' leave granted him on 4th inst. by Post Commander Fort Brady, Mich., is extended twenty-three days.—*S. O. 19, Department of the East, February 6, 1882.*

COMEGYS, E. T., *Captain and Assistant Surgeon.*—To be relieved from temporary duty at Columbus Barracks, Ohio, on receipt of order, and to report in person to Commanding General Department of the Missouri for assignment to duty.—*S. O. 32, A. G. O. February 9, 1882.*

THE MEDICAL NEWS *will be pleased to receive early intelligence of local events of general medical interest, or which it is desirable to bring to the notice of the profession.*

Local papers containing reports or news items should be marked.

Letters, whether written for publication or private information, must be authenticated by the names and addresses of their writers—of course not necessarily for publication.

All communications relating to the editorial department of the NEWS *should be addressed to No. 1004 Walnut Street, Philadelphia.*